C21.5:1057/4 Engin

260

Vol. 1057 Number 4

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

The University of Michigan Engineering Library

THE UNIVERSITY OF MICHIGAN

SEP 02 1985

Route to:

PATENTS

August 27, 1985

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

August 27, 1985 Volume 1057 Number 4

THE UNIVERSITY OF MICHIGAN
OCT 02 1985
ENGINEERING LIBRARY

CONTENTS

	Page
Patent and Trademark Office Notices	
Patent Cooperation Treaty (PCT) Information	1057 OG 38
Notice of Maintenance Fees Payable	1057 OG 38
Board of Appeals Decisions Rendered	1057 OG 38
Reissue Applications Filed	1057 OG 39
Requests for Reexaminations Filed	1057 OG 39
PTO Status	1057 OG 40
Patent Certificates of Correction	1057 OG 42
Disclaimers	1057 OG 42
Disclaimers and Dedications	1057 OG 42
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1057 OG 43
Condition of Patent Applications	1057 OG 44
Reexaminations	1465
Reissue Patents Granted (31,974)	1467
Plant Patents Granted (5,542)	1469
Patents Granted	
General and Mechanical (4,536,889)	1471
Chemical (4,537,594)	1721
Electrical (4,538,019)	1837
Design Patents Granted (280,250)	1937
Index of Patentees	PI 1
Indices of Reissue, Reexamination, Design and Plant Patentees	PI 53
Classification of	
Patents (Including Reissues and Reexaminations)	PI 57
Designs and Plants	PI 60
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 61
Designs and Plants	PI 62
Change of Address Form and Subscription Order Form	Back Page

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published in the *Official Gazette* at 1021 O.G. 11 on Aug. 10, 1982.

The Search fee for the European Patent Office was changed as of May 7, 1985 and was published in the *Official Gazette* at 1053 O.G. 42 on Apr. 16, 1985.

International PCT fees were changed effective May 28, 1985 and were announced in the *Official Gazette* at 1053 O.G. 42 on Apr. 16, 1985.

The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	620.00
International fees	
Basic fee (first 30 pages)	230.00
Basic Supplemental fee (for each page over 30)	4.00
Designation fee (for the first 10 national or regional offices)	55.00
Designation fee for 11th and subsequent designations	No charge

DONALD J. QUIGG,
Acting Commissioner of Patents and Trademarks.

May 7, 1985.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), effective Nov. 1, 1984. If the maintenance fee is not paid in a patent requiring such payment, the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on August 24, 1982 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Plant Patents	None
Utility Patents	4,345,335 through 4,346,480

Reissue Patents based on the above identified patents.

No maintenance fees are required for design patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 200.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 200.00
By other than a small entity . . . . . $ 400.00"

The amounts of the surcharges, effective Nov. 1, 1984, are set forth in 37 CFR 1.20(k)-(m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 100.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 50.00
By other than a small entity . . . . . $ 100.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee on a patent based on an application filed on or after Aug. 27, 1982, where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Board of Appeals Decisions Rendered in the Month of May 1985

Affirmed	185
Affirmed in Part	41
Reversed	75
Total	301

Board of Appeals Decisions Rendered in the Month of July 1985

Affirmed	164
Affirmed in Part	36
Reversed	77
Total	277

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,391,885, Re. S.N. 752,359, Filed July 5, 1985, Cl. 430/028, METHOD OF MANUFACTURING FLUORESCENT SCREENS OF CATHODE RAY TUBES, Yoshifumi Tomita, et al., Owner of Record: *Hitachi, Ltd., Tokyo, Japan,* Attorney or Agent: Charles E. Pfund, et al., Ex. Gp.: 156

4,391,898, Re. S.N. 750,139, Filed July 1, 1985, Cl. 430/306, METHOD OF MAKING A SLEEVE FOR A PRINTING CYLINDER, Hendricus J. van der Velden, Owner of Record: *Stork Screens B.V., Boxmeer, The Netherlands,* Attorney or Agent: Richard H. Tushin, et al., Ex. Gp.: 156

4,392,791, Re. S.N. 754,532, Filed July 11, 1985, Cl. 417/379, PRESSURE PUMPING AND PRIMING PUMP APPARATUS, Harold Mandroian, Owner of Record: *Inventor,* Attorney or Agent: Philip S. Johnson, et al., Ex. Gp.: 343

4,420,484, Re. S.N. 752,332, Filed July 3, 1985, Cl. 514/332, BASIC AMINO OR AMMONIUM ANTIMICROBIAL AGENT-POLYETHYLENE GLYCOL ESTER SURFACTANT-BETAINE AND/OR AMINE OXIDE SURFACTANT COMPOSITIONS AND METHOD OF USE THEREOF, William G. Gorman, et al., Owner of Record: *Sterling Drug, Inc., New York, N.Y.,* Attorney or Agent: B. Woodrow Wyatt, et al., Ex. Gp.: 125

4,427,213, Re. S.N. 752,830, Filed July 8, 1985, Cl. 280/711, VEHICLE SUSPENSION WITH RIGID TORQUE BEAM, John E. Raidel, Jr., Owner of Record: *Inventor,* Attorney or Agent: Edmund C. Rogers, et al., Ex. Gp.: 316

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,774,056, Reexam. No. 90/000,808, Requested: June 27, 1985, Cl. 307/480, DIGITAL ELECTRONIC CONTROL CIRCUIT FOR CYCLICALLY OPERABLE APPLIANCES AND THE LIKE, Steven B. Sample, et al., Owner of Record: *Design and Manufacturing Corp., Connersville, Ind.,* Attorney or Agent: Melville, Strasser, et al., Ex. Gp.: 254, Requester: Sharp Corp., Abeno-Ku, Osaka 545, Japan

3,964,405, Reexam. No. 90/000,824, Requested: July 22, 1985, Cl. 111/6, PERENNIAL WEED CONTROL BY DEEP PLACEMENT OF VOLATILE SOIL FUMIGANTS, William A. Haglung, et al., Owner of Record: *Inventor,* Attorney or Agent: Seed, Berry, et al., Ex. Gp.: 330, Requester: Dow Chemical Co., Midland, Mich.

4,032,296, Reexam. No. 90/000,828, Requested: July 30, 1985, Cl. 422/89, ELECTROLYTIC CONDUCTIVITY DETECTOR SYSTEM, Randall C. Hall, Owner of Record: *Purdue Research Foundation, Inc., West Lafayette, Ind.,* Attorney or Agent: Arnold, White, et al., Ex. Gp.: 134 Requester: Purdue Research Foundation, Houston, Tex.

4,217,027, Reexam. No. 90/000,810, Requested: July 2, 1985, Cl. 350/96.3, OPTICAL FIBER FABRICATION AND RESULTING PRODUCT, John B. MacChesney, et al., Owner of Record: *Inventor,* Attorney or Agent: William L. Keefauver, Ex. Gp.: 133, Requester: ITT Corp., Secaucus, N.J.

4,354,007, Reexam. No. 90/000,826, Requested: July 24, 1985, Cl. 525/370, PROCESS FOR PREPARING OXIDATIVELY-STABLE POLYMERS, Gerald Scott, Owner of Record: *Inventor,* Attorney or Agent: Cushman, Darby, et al., Ex. Gp.: 155, Requester: Gerald Scott, Staffordshire, England

4,405,881, Reexam. No. 90/000,823, Requested: July 22, 1985, Cl. 313/477, COLOR CATHODE RAY TUBE INCLUDING Nd2°3 AND Cr2°3 IN FACE GLASS, Hiroo Kobayashi, Owner of Record: *Mitsubishi Denki Kabushki Kaisha, Tokyo, Japan,* Attorney or Agent: Oblon, Fisher, et al., Ex. Gp.: 260, Requester: General Electric Co., Portsmouth, Va.

4,438,584, Reexam. No. 90/000,827, Requested: July 25, 1985, Cl. 58/4, TRAP FOR RATS, MICE AND OTHER VERMIN, Stanley Z. Baker, et al., Owner of Record: *J. T. Eaton & Co., Inc., Twinsburg, Ohio,* Attorney or Agent: Body, Vickers, et al., Ex. Gp.: 320, Requester: Hampton Chemical, Inc., Riverdale, N.Y.

4,483,720, Reexam. No. 90/000,825, Requested: July 22, 1985, Cl. 148/6.14, PROCESS FOR APPLYING THERMAL BARRIER COATINGS TO METALS, Robert W. Bartlett, et al., Owner of Record: *SRI International, Menlo Park, Calif.,* Attorney or Agent: Edward B. Gregg, Ex. Gp.: 150, Requester: Owner

Status of PTO Services

The following is an update of the status of PTO services for July 1985:

Service Item	FY 1985 Performance Goal (Calendar Days)	Monthly Average	Comment
Filing Receipts:			
Patents	22	19	
Trademarks	30	29	
Patent/Trademark Copies:			
Special Window Coupons	1*	99% within 1 day	
Window Coupons	5	94% within 5 days	
Mail Coupons	29 (26)*	99% within 26 days**	
Letter Orders	34 (26)*	99% within 26 days**	
Date of oldest unfilled order		July 17, 1985	
Current Mail Date being processed		July 26, 1985	
Certified Copies:			
Trademark Registrations	30	25	
Applications-As-Filed	20 (10)*	92% within 7 days	
File-Wrapper/Contents	N/A	99% within 7 days	
Walk-up Certification	1	97% within 24 hours	
Trademark Search Library:			
Filing Pending Marks	21	33	Delays in publication pipeline and in filing.
Filing Reg. Certificates	3 (Issue Date)*	On schedule	
Assignments:			
Patents	25 (20)*	20	
Trademarks	25 (20)*	18	
Avg. Days from Issue Fee Payment to Issue Date	90–100	85	
Issue Fee Receipts Mailed	4 weeks prior to Issue Date	On schedule	
Patent Official Gazette:			
In Bookstore	Issue Date	On schedule	
Mailed	Issue Date	On schedule	
Patent Grants Mailed	Issue Date	On schedule	
Trademark Official Gazette:			
In Bookstore	Issue Date	On schedule	
Mailed	Issue Date	On schedule	
Trademark Regs. Mailed	Issue Date	3 days late	Delayed to account for all withdrawals.
Patent Copies Available	Issue Date	98% on Issue Date	
Trademark Copies Available	Issue Date	99% on Issue Date	

*Reflects new goal for faster service.
**Figures include postal processing and delivery time.

IMPROVEMENTS TO SERVICE

- *Goals for Faster Service* — One of our special service objectives for this year was to commit to goals for faster service. As you will note on the report above, seven goals have been reduced. We will continue to look for ways to expedite services, as well as improve quality.

- *Extensions of Time in Drawing Corrections* — Effective July 15, 1985, extensions of time to effect drawing corrections will be granted by the Chief Draftsman where a delay in availability of drawings, or delay in review of drawings was caused by the Office.

- *Ordering Reexamination and Patent Files* — Recent comments from the public pointed out that a person ordering a patent file, unaware that a reexamination file on the same patent existed, would only receive the ordered patent file. The reexamination file not being ordered, would not be received. This situation resulted in an incomplete file being obtained as the reexamination file is an extension of the patent file.
  To overcome this problem the procedures which are used to request patented and abandoned files from the Files Repository have been modified so that (1) upon ordering a patent file, any and all associated reexamination files of that patent are automatically and simultaneously ordered and (2) upon ordering a reexamination file, the corresponding original patent file and any other associated reexamination files are automatically and simultaneously ordered.

HELPFUL HINTS FROM THE PTO

- *Returning Files to the File Information Unit (FIU)* — Recently, files obtained through the FIU have been left in the Public Search Room at the close of business rather than being returned as required.

  All customers are reminded that files obtained through the FIU are official government records which must be returned to the FIU by 7:45 p.m. on the same day they are obtained. Additionally, files obtained through the FIU shall not be removed from the confines of the Public Search Room at any time.
  Adherence to these regulations is requested. Continued violations will result in cessation or suspension of individual privileges.

- *Information Cited on Form PTO–1449*

  The Public is encouraged to use Form PTO–1449, "Information Disclosure Citation," when preparing a statement under 37 CFR 1.97–1.99 (see MPEP §609). This form provides the Office with a uniform way of listing the citations and vehicle from which the information thereon can be printed on the issued patent.
  Recently, citations are being presented on various forms prepared by the public rather than on Form PTO–1449. As a result, delays are cropping up in the printing process. Because the printer has difficulty in following the various formats and is having to query the examiner each time a non-PTO–1449 form is used, you are encouraged to use the Form PTO–1449 with any submission under 37 CFR 1.97–1.99.
  Note that listing citations on Form PTO–1449 does not raise an irrebuttable presumption that the citation is prior art. A holding by an examiner that any citation on Form PTO–1449 is prior art to claimed subject matter can be rebutted by procedures commonly used to rebut the prior art status of an examiner's citations on Form PTO–892, "Notice of References Cited".
  Among the information that should be provided on Form PTO–1449 is the date of the citation. In addition, it is helpful if the class and subclass of each citation is provided. It is appreciated that classification information may not be known at the time Form PTO–1449 is prepared. When classification information is not known, draw a line in the boxes under the class and subclass heading adjacent to the citation for which classification information is not known.

Aug. 5, 1985.

THERESA A. BRELSFORD,
Assistant Commissioner
for Administration.

PATENT NOTICES

Certificates of Correction for the Week of Aug. 27, 1985

Re. 31,468	4,490,387	4,503,633	4,511,605
Re. 31,670	4,490,642	4,503,829	4,511,669
Re. 31,784	4,491,004	4,504,170	4,511,689
Re. 31,826	4,491,324	4,504,291	4,511,698
4,393,370	4,491,343	4,504,576	4,511,703
4,414,222	4,491,344	4,504,607	4,511,734
4,416,124	4,491,675	4,504,814	4,511,747
4,418,123	4,491,777	4,504,869	4,512,096
4,433,999	4,493,778	4,504,872	4,512,104
4,434,037	4,494,958	4,504,879	4,512,116
4,434,686	4,495,288	4,505,067	4,512,183
4,443,110	4,495,647	4,505,151	4,512,222
4,451,795	4,495,703	4,505,626	4,512,273
4,454,103	4,496,057	4,506,293	4,512,629
4,457,967	4,496,148	4,506,738	4,512,648
4,461,376	4,496,556	4,507,139	4,512,667
4,465,618	4,496,575	4,507,143	4,512,684
4,466,312	4,496,885	4,507,239	4,512,722
4,467,446	4,497,157	4,507,438	4,513,068
4,467,577	4,497,158	4,507,451	4,513,204
4,469,455	4,497,206	4,507,459	4,513,397
4,470,911	4,497,363	4,507,617	4,513,514
4,471,162	4,497,615	4,507,623	4,513,828
4,473,216	4,497,917	4,507,827	4,514,149
4,473,245	4,498,531	4,508,092	4,514,255
4,475,597	4,498,537	4,508,203	4,514,308
4,476,523	4,498,702	4,508,309	4,514,384
4,477,762	4,498,708	4,508,355	4,514,468
4,479,172	4,498,765	4,508,455	4,514,540
4,481,067	4,498,893	4,508,949	4,514,550
4,482,331	4,499,066	4,509,015	4,514,602
4,482,474	4,499,316	4,509,181	4,514,916
4,483,122	4,499,625	4,509,279	4,515,079
4,483,222	4,499,637	4,509,494	4,515,427
4,484,776	4,500,131	4,509,644	4,515,453
4,484,779	4,500,789	4,509,847	4,515,476
4,485,404	4,500,906	4,509,877	4,515,635
4,486,148	4,501,253	4,509,932	4,516,009
4,488,220	4,501,548	4,510,043	4,516,152
4,489,047	4,501,587	4,510,100	4,516,170
4,489,095	4,501,727	4,510,503	4,516,891
4,489,104	4,501,874	4,510,972	4,517,231
4,489,318	4,503,372	4,511,198	4,520,904
4,490,096	4,503,374	4,511,354	4,521,669
4,490,227	4,503,569	4,511,372	

Disclaimers

3,937,813.—*Robert Kingsbury Clark, Jr.*, St. Petersburg, Fla. INSECTICIDAL COMPOSITIONS COMPRISING MIXTURES OF BACILLUS THURINGIENSIS AND CHLORDIMEFORM. Patent dated Feb. 10, 1976. Disclaimer filed June 26, 1985, by the assignee, *Abbott Laboratories.*

Hereby enters this disclaimer to claims 1–6 of said patent.

4,041,283.—*John E. Mosier*, Duncan Okla. RAILWAY TRAIN CONTROL SIMULATOR AND METHOD. Patent dated Aug. 9, 1977. Disclaimer filed June 10, 1985, by the assignee, *Halliburton Co.*

Hereby enters this disclaimer to claims 1 through 20 of said patent.

4,042,810.—*John E. Mosier*, Duncan, Okla. METHOD AND APPARATUS FOR FACILITATING CONTROL OF A RAILWAY TRAIN. Patent dated Aug. 16, 1977. Disclaimer filed June 10, 1985, by the assignee, *Halliburton Co.*

Hereby enters this disclaimer to claims 73 through 82 of said patent.

4,385,724.—*Larry R. Ramsauser* and *Ronald M. Scholer*, both of San Jose, Calif. APPARATUS FOR CONTROLLING THE WATER TEMPERATURE OF A SPA. Patent dated May 31, 1983. Disclaimer filed Dec. 21, 1984, by the assignee, *Ramco Manufacturing, Inc.*

The term of this patent subsequent to Sept. 20, 1984, has been disclaimed.

4,493,253.—*Arvindkumar C. Vyas*, Waterloo, Canada. VARIABLE IMPACT PRINTING MEANS. Patent dated Jan. 15, 1985. Disclaimer filed July 2, 1985, by the assignee, *NCR Canada LTD-NCR Canada LTEE.*

Hereby enters this disclaimer to claim 1 of said patent.

Disclaimers and Dedications

3,621,323.—*Frank W. Thomas*, Baltimore, Md.; and *William R. Tooke, Jr.*, Atlanta, Ga. COATED INCANDESCENT ELECTRIC LAMP. Patent dated Nov. 16, 1971. Disclaimer and Dedication filed June 8, 1984, by the assignee, *Thomas Manufacturing Corp.*

Hereby disclaims and dedicates to the Public the entire remaining term of said patent.

4,516,698.—*Vincent J. Cerrato*, Camarillo, Calif. KEG-PUMP CONSTRUCTION. Patent dated May 14, 1985. Disclaimer and Dedication filed June 21, 1985, by the assignee, *Vending Components, Inc.*

Hereby disclaims and dedicates to the Public the entire term of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware Library	(302) 451-2238
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF July 20, 1985

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	12-28-83
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	6-01-83
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-12-84
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	11-30-83
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	4-11-83
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	3-21-83
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	7-16-82
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director	10-11-83
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	4-30-82
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	4-19-83
DESIGN, GROUP 290—K. L. CAGE, Director	2-11-83
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	7-12-83
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	8-29-83
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	3-10-83
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	4-15-83
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	4-02-84

Expiration of patents: The patents within the range of numbers indicated below expire during July 1985, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents . . . . . Numbers 3,390,405 to 3,395,405, inclusive

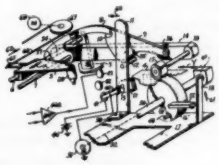
Plant Patents . . . . . Numbers 2,817 to 2,824 inclusive

REEXAMINATIONS

AUGUST 27, 1985

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination

B1 Re. 31,684 (372nd)
X-Y PLOTTER
John O. Yeiser, Mission Viejo, Calif., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.
Reexamination Request No. 90/000,628, Sep. 14, 1984.
Reexamination Certificate for Reissue Patent Re. 31,684, issued Sep. 25, 1984, Ser. No. 442,028, Nov. 15, 1982.
Original No. 3,761,950, dated Sep. 25, 1973, Ser. No. 64,467, Aug. 17, 1970. Request filed Sep. 14, 1984, Ser. No. 64,467
Int. Cl.[3] G01D *9/38*
U.S. Cl. 346—68



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1**, **2**, and **4–12** is confirmed.

Claim **3** is determined to be patentable as amended.

1. An X–Y plotter comprising:
a table adapted to support a cut chart slidably thereon;
a fixed carriage guide extending across said table in an X-direction;
a carriage with a marking element, supported by said guide and movable therealong to provide X-deflection of said marking element across said chart;
driving roller means with pinch roller means engageable with said chart to provide bidirectional recording displacement of said chart across said table in the Y-direction orthogonal to said X-direction;
electromechanical X-servo means connected drivably to said carriage; and
electromechanical Y-servo means connected drivably solely to said driving roller means,
said bidirectional displacement of said cut chart being the sole provision for relative displacement of said chart and said marking element for recording in said Y-direction.

REISSUES

AUGUST 27, 1985

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

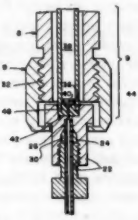
Re. 31,974
CARTRIDGE TYPE SEPARATION COLUMN AND HOLDER ASSEMBLY FOR LIQUID CHROMATOGRAPHS

Robert Brownlee, Los Altos Hills, Calif., assignor to Brownlee Labs, Inc., Santa Clara, Calif.

Original No. 4,283,280, dated Aug. 11, 1981, Ser. No. 116,466, Jan. 29, 1980. Continuation of Ser. No. 936,400, Aug. 24, 1978, abandoned. Application for reissue Jun. 28, 1982, Ser. No. 392,896

Int. Cl.³ B01D *15/08*

U.S. Cl. 210—198.2 **25 Claims**



11. An improved column cartridge for use in a liquid chromatograph having a pump and connected to a column input line for delivering a sample and eluent under pressure to an LC column and a column output line connected from the column to a detector for analyzing the column output, said cartridge comprising a circularly cylindrical solid tube having a bore therethrough, a chromatograph sorbent disposed in said bore, filter and seal means arranged across the opening of the bore at each end of the tube and mounted with the tube and sorbent as a self-contained unit to permit the same to be independently handled, said cartridge having no mounting structure associated therewith normally used to apply any force between any part of the cartridge and any external member, a pair of end fittings, each having one end connected to one of said input/output lines and the other end connected and arranged for mating contact with a respective of said column cartridge, a seal interposed between each said end fitting and said column cartridge, said cartridge seal and each end fitting being constructed and arranged to mate and to center together so as to establish a high pressure sealing configuration when placed in axial compression, means for contacting the outer ends of said end fittings for placing the same under axially directed inward force pushing said fittings against the ends of said cartridge, said cartridge being constructed to receive the compression force created by said end fittings and contacting means.

Re. 31,975
POLYESTER COMPOSITIONS

Lowell R. Comstock, Brookfield Center, Conn., and Percy L. Smith, Dunbar, W. Va., assignors to Union Carbide Corp., Danbury, Conn.

Original No. 4,288,571, dated Sep. 8, 1981, Ser. No. 336,120, Feb. 26, 1973. Continuation-in-part of Ser. No. 72,798, Sep. 16, 1970, Pat. No. 3,718,714, and Ser. No. 107,514, Jan. 18, 1971, abandoned, which is a continuation-in-part of Ser. No. 8,070, Feb. 2, 1970, abandoned. Application for reissue Sep. 8, 1983, Ser. No. 529,737

Int. Cl.³ C08L *67/06*

U.S. Cl. 523—514 **41 Claims**

1. A composition, suitable for use in molding, comprising an ethylenically unsaturated monomer, an unsaturated polyester which is the condensation product of an ethylenically unsaturated polycarboxylic acid or anhydride and a polyol, and, as a low profile additive, in an amount of from about 1 to about 85 weight percent, based on weight of said unsaturated polyester, a carboxyl containing polymer of a vinyl ester of an aliphatic, saturated monocarboxylic acid, wherein said carboxyl containing polymer contains from about 0.2 to about 5 weight percent of a polymerized carboxyl containing comonomer, and at least about 5 weight percent of polymerized vinyl alkanoate.

41. A composition as defined in claim 40 wherein said thermoplastic polymer is prepared from a polymerizable, ethylenically unsaturated monomer selected from the group consisting of vinyl chloride, vinyl bromide, vinyl fluoride, vinylidene chloride, vinylidene bromide, methyl acrylate, ethyl acrylate, butyl acrylate, n-octyl acrylate, 2-ethyl hexyl acrylate, n-decyl acrylate, glycidal methacrylate, acrylamide, n-methyl acrylamide, n,n-dimethylacrylamide, methyl acrylamide, n-methyl methacrylamide, n,n-dimethyl methacrylamide, acrylonitrile, chloroacrylonitrile, methacrylonitrile, ethacrylonitrile, vinyl naphthalene, dimethyl maleate, dibutyl maleate, vinyl methyl ether, vinyl ethyl ether, vinyl isobutyl ether, 2-chloroethyl vinyl ether, methyl vinyl ketone, ethyl vinyl ketone, isobutyl vinyl ketone, vinyl pyridine, n-vinyl carbazole, n-vinyl pyrrolidene, ethyl methylene malonate, isobutylene, ethylene, trichloroethylene, propylene, and vinyl norbornene.

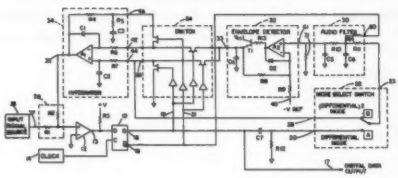
Re. 31,976
CIRCUITRY FOR GENERATING REFERENCE SIGNAL FOR DELTA ENCODING SYSTEMS

Richard E. DeFreitas, Westford, Mass., assignor to Analog and Digital Systems, Inc., Wilmington, Mass.

Original No. 4,305,050, dated Dec. 8, 1981, Ser. No. 71,246, Aug. 30, 1979. Continuation-in-part of Ser. No. 875,336, Feb. 6, 1978, Pat. No. 4,190,801. Application for reissue Mar. 3, 1983, Ser. No. 471,723

Int. Cl.³ H03K *13/22*

U.S. Cl. 332—11 D **28 Claims**



1. In an electrical system of the type in which a digitally encoded signal is determined at least in part by the difference between a present value of an input signal and a reference signal representative of a past value of said input signal, improved circuitry for generating said reference signal, comprising extraction means for extracting from the pattern of bits in said digitally encoded signal information relating to the time derivative of said present value to provide a corresponding control signal, said extraction means including a filter, and [an envelope detector] *means for providing a control signal that rises, to follow increases in said derivative, and decays more slowly than it rises upon decreases in said derivative,* said control signal from said extraction means being fed to *a digital-signal-generating means, which comprises* an integrating means, said integrating means being responsive to said [control] *digitally encoded* signal to provide said reference signal.

Re. 31,977

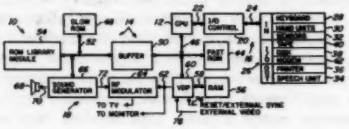
DIGITAL COMPUTING SYSTEM HAVING AUTO-INCREMENTING MEMORY

Granville E. Ott, Lubbock, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Original No. 4,286,320, dated Aug. 25, 1981, Ser. No. 20,111, Mar. 12, 1979. Application for reissue Aug. 19, 1983, Ser. No. 524,629

Int. Cl.[3] **G06F** *13/00, 13/06*

U.S. Cl. 364—200 **11 Claims**



11. A plug-in library module for use in a digital computing system having a central processing unit adapted to interact with a plurality of memory means each having a pre-assigned page number and a plurality of sequentially accessed address location, and wherein said central processing unit provides an address including both a page number corresponding to the pre-assigned page number of one of said plurality of memory means and the local address of a selected one of said plurality of sequentially accessed address locations, provides a memory access request including a read data signal, and is responsive to processing information provided thereto in response to said memory access request, and interface means including a plug-in type port for temporarily receiving said library module and for providing communication between the central processing unit and said library module, said library module comprising:

one of said memory means disposed within said library module, said memory means having processing information contained therein at sequentially accessed address locations;

first means for storing a page number provided by said central processing unit and for providing an enable signal when the stored page number corresponds to the pre-assigned page number of the memory means disposed within said library module,

second means for storing the local address provided by said central processing unit and for providing said local address to the memory means disposed within said library module,

connector means disposed within said library module and connectable to the plug-in port of said interface means, said connector means connecting the address provided by said central processing unit to said first and second storage means, and connecting the processing information outputted by said memory means to said central processing unit; and

control means responsive to the receipt from said central processing unit of a memory access request including a read data signal and to said enable signal for outputting the processing information at the memory location corresponding to the local address provided to said memory means and for incrementing the local address in said second storage means to the address of the next sequentially accessed location in said memory means, said control means being further operative to maintain the local address located in said second storage means in an unaltered state in the absence of a memory access request, whereby the processing information contained in said next sequentially accessed address location will be provided by said memory means in response to another memory access request including a read data signal.

PLANT PATENTS

GRANTED AUGUST 27, 1985

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,542
ALSTROEMERIA NAMED STALTANG

Jacob van Andel, Aalsmeer, Netherlands, assignor to B. V. Handelskwekerij, M.C. van Staaveren, Aalsmeer, Netherlands

Filed Aug. 11, 1983, Ser. No. 522,313
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinctive alstroemeria hybrid, substantially as herein shown and described, characterized by the generally magnolia purple coloration of its very large and profusely blooming flowers.

5,543
AFRICAN VIOLET PLANT NAMED MARGUERITE

Arnold Fischer, Hanover, Fed. Rep. of Germany, assignor to Pan American Plant Company, Parrish, Fla.

Filed Oct. 7, 1983, Ser. No. 539,935
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet named Marguerite, as described and illustrated, and particularly characterized by its large pink ruffled flowers that are star-shaped and actinomorphic rotate; compact rosette habit, with the flowers being carried on upright peduncles; floriferous habit, and its pleasantly contrasting dark green foliage.

5,544
CARNATION NAMED STANQUIN

Jacob van Andel, Aalsmeer, Netherlands, assignor to B. V. Handelskwekerij M. C. van Staaveren, Aalsmeer, Netherlands

Filed Nov. 30, 1983, Ser. No. 556,261
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—70 **1 Claim**

1. A new and distinct carnation variety, substantially as herein shown and described, characterized by its continuous production of very light green-yellow flowers of medium size.

5,545
CARNATION NAMED HILKARI

Jan J. Hilverda, Aalsmeer, Netherlands, assignor to Hilverda B.V., Aalsmeer, Netherlands

Filed Dec. 8, 1983, Ser. No. 559,358
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—71 **1 Claim**

1. The new and distinct variety of spray carnation, substantially as herein shown and described, characterized in particular by its delicate pink flower color, its profuse and continuous blooming habit, and the rapid growth rate of its tall, spray shape bush with relatively long flower stems.

5,546
ASPARAGUS PLANT-FEMALE PLANT NO. 53 INEZ

J. Howard Ellison, Milltown, and John J. Kinelski, Princeton, both of N.J., assignors to Rutgers University, New Brunswick, N.J.

Filed Oct. 21, 1983, Ser. No. 544,008
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—89 **1 Claim**

1. A new and distinct variety of Asparagus Plant as herein shown and described, distinguished particularly as to novelty by its unique combination of predominately female characteristics, which transmit high yield, resistance to rust (*Puccinia asparagi*), tolerance to root and crown rot (*Fusarium oxysporum*) and (*F. moniliforme*), maintaining vigor through long life, enabling growth of hybrids where standard susceptible cultivars cannot be grown profitably.

PATENTS

GRANTED AUG. 27, 1985

ERRATA

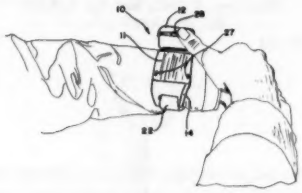
For CLASS	See PATENT NO.
623–003	4,536,893
623–022	4,536,894
623–006	4,536,895
623–006	4,536,896
623–006	4,536,897
623–033	4,536,898
514–009	4,537,772
514–063	4,537,773
514–398	4,537,775
514–424	4,537,776
514–521	4,537,777
514–275	4,537,779
514–464	4,537,780
514–616	4,537,781
514–774	4,537,782
423–502	4,537,835
435–215	4,537,852
252–052	4,537,920
525–424	4,537,947

PATENTS

GRANTED AUGUST 27, 1985

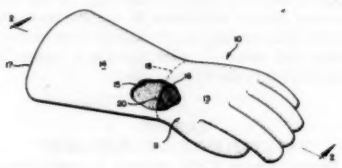
GENERAL AND MECHANICAL

4,536,889
FACE AND NOSE WIPER HOLDING DEVICE FOR SKIERS
Kevin D. Taylor, Ogden, and Galen N. Nichols, Salt Lake City, both of Utah, assignors to TNF Enterprises, Salt Lake City, Utah
Filed Mar. 8, 1984, Ser. No. 587,664
Int. Cl.[3] A41D *19/00*
U.S. Cl. 2—160 **10 Claims**



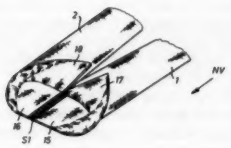
1. A holder for face and nose wiper means, comprising:
means for securing the holder to an upper limb of a skier;
generally rigid base member means;
means for securing the wiper means to the holder comprising clamping means for securing the wiper means to the base member means;
generally rigid wiper covering means covering the wiper means when not being used and retractable with respect to the base member means to expose the wiper means for use.

4,536,890
GLOVE FOR LOW PARTICULATE ENVIRONMENT
Steve M. Barnett, Glencoe, Ill.; Michael A. Flowers, Ontario, Calif., and John A. Varos, Willard, Ohio, assignors to Pioneer Industrial Products Company, Willard, Ohio
Filed Feb. 21, 1984, Ser. No. 581,691
Int. Cl.[3] A41D *19/00*
U.S. Cl. 2—164 **5 Claims**



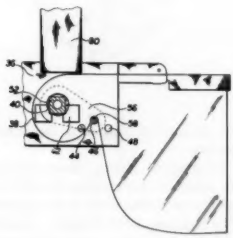
1. A glove for use in a low particulate environment, said glove comprising:
an external shell composed of a material selected from the group consisting of polyvinyl chloride and elastomeric materials;
said external shell comprising a hand portion for enclosing the hand of a glove wearer and a gauntlet portion for enclosing the wrist and the lower forearm of the glove wearer;
said external shell having inside and outside surfaces;
and an internal lining attached to the inside surface of said hand portion;
said internal lining being composed of fibrous material, said fibrous material being of a kind from which particles may become detached if there were abrasion between said material and the surface of a sleeve on an article of clothing worn by the glove wearer;
the inside surface of said gauntlet portion being devoid of any lining from which said particle may become detached.

4,536,891
METHOD AND APPARATUS FOR MANUFACTURING PANTYHOSE
Werner Angele, Au am Rhein, Fed. Rep. of Germany, assignor to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany
Filed Aug. 25, 1982, Ser. No. 411,335
Claims priority, application Fed. Rep. of Germany, Sep. 4, 1981, 3134984
Int. Cl.[3] A41B *9/04*
U.S. Cl. 2—409 **3 Claims**



1. A method of manufacturing pantyhose using a sewing machine and hose shaped leg part workpiece, comprising arranging the leg parts in a flattened side by side longitudinally extending relationship, cutting each leg part along their adjacent inner edges from the waist rim of its panty area up to a crotch leaving a remaining leg portion of each leg part uncut and so as to form upper and lower plies of each leg cut along their inner opposite edges, sewing the cut edges of the laterally adjacent lower plies together from the waist rim to the crotch to form a seam, deflecting the outer plies outwardly to overlie the remaining leg portions, and continuing to sew the seam by sewing in the same direction the edge portions of the upper plies together.

4,536,892
RIOT FACESHIELD ASSEMBLY
Carl H. Brinkhoff, Pittsburgh, and Gordon C. Scott, Verona, both of Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.
Filed Apr. 23, 1984, Ser. No. 602,850
Int. Cl.[3] A61F *9/04*
U.S. Cl. 2—424 **8 Claims**



1. A riot faceshield assembly adapted for use with a variety of protective helmets of varying sizes, comprising:
a transparent protective faceshield member for protecting the face of a user;
first and second bracket members, each of said bracket mem-

bers including intermediate faceshield member fastening means for pivotally securing said faceshield member for movement between a protective orientation and an upraised position, each of said bracket members further including front and rear helmet engaging arms for engaging the edge of said helmet at positions in front of and behind the position of said intermediate faceshield member fastening means to limit the upward movement of said faceshield assembly relative to said helmet;

said intermediate faceshield member fastening means including at least two distinct pivot points to which said faceshield member may be pivotally secured, to permit said faceshield member to be adjusted in position relative to said front edge of said helmet to maintain said generally sealing relationship with helmets of different dimensions;

strap means secured at one end adjacent one of said bracket members and at its other end adjacent the other of said bracket members and adapted to be positioned over the top of said helmet to provide an upward bias upon said bracket members to urge said engaging arms against said edge of said helmet;

further wherein said bracket members are configured relative to said helmet to bring said faceshield member into a generally sealing relationship with the front edge of said helmet when said faceshield member is pivoted into its protective orientation; and

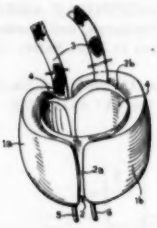
means for preventing said faceshield member from pivoting beyond said protective orientation, wherein said preventing means includes a solid pin member secured within each of said bracket members and positioned to rest in groove means in said faceshield member when said faceshield member is pivoted into said protective orientation, said pin members being movable to different positions relative to said bracket members to correspond to movement of said faceshield member between said at least two distinct pivot points.

4,536,893

IMPLANT DEVICE FOR SUBSTAINING THE ACTIVITY OF THE MYOCARDIUM

Roberto Parravicini, Corso Genova 13, Milan, Italy

Continuation of Ser. No. 387,897, Jun. 14, 1982, abandoned. This application Nov. 7, 1984, Ser. No. 669,052
Claims priority, application Italy, Mar. 3, 1982, 67241 A/82
Int. Cl.³ A61F 1/00
U.S. Cl. 623—3 **5 Claims**



1. An implant device for sustaining the activity of the myocardium comprising:

a container housing including two substantially separate rigid shells adapted to envelop the left ventricular wall and the right ventricular wall of the myocardium, respectively, and a biocompatible fabric connecting strip bridging a space formed between said shells between said shells and securely attached to said shells wherein said fabric extends in said space between said shells in correspondence with the interventricular sulcus for attachment thereto by suturing,

membrane means secured to the inner surface of said shells defining two separate independent pumping chambers each adapted to act independently on the left ventricular wall and the right ventricular wall of the myocardium, respectively, and means for selectively and separately feeding fluid to said two chambers so as to cause expansion of the chambers and consequent compression of the left ventricular wall and the right ventricular wall of the myocardium.

4,536,894

HIP PROSTHESIS WITH FLARED POROUS BONY INGROWTH PADS

Jorge O. Galante, One Brighton La., Oak Brook, Ill. 60521, and William Rostoker, 2052 W. 108th Pl., Chicago, Ill. 60643

Filed Aug. 4, 1983, Ser. No. 520,347
Int. Cl.³ A61F 1/04
U.S. Cl. 623—22 **13 Claims**

1. In a femoral insert for hip joint prothesis having a generally spherical shaped head member, a neck member connected to the head member and a stem having a proximal portion connected to the head member and a distal portion, the improvement comprising:

said stem having substantially flat anterior and posterior sides, each said side having a hollow depression therein, and

on each of the anterior and posterior sides of said stem, a porous body ingrowth member extending from said hollow depression over at least that region of the proximal portion corresponding to the metaphyseal portion of the bone, each of said porous members gradually increasing in thickness and protruding increasingly further out of its respective hollow depression in the proximal direction, whereby said increasingly thick porous members on said anterior and posterior sides provide a wedge tight fit when inserted in the femoral canal.

4,536,895

VAULTED INTRAOCULAR LENS

Timothy Bittner, Duarte, Calif., assignor to Ioptex Inc., Azusa, Calif.

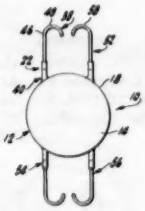
Filed Feb. 16, 1983, Ser. No. 466,918
Int. Cl.³ A61F 1/16, 1/24
U.S. Cl. 623—6 **2 Claims**

1. An intraocular lens for placement within an eye comprising:

a. an optical portion having an optical plane;

b. means for positioning said optical portion in the eye, said means comprising first and second appendage units, each of said first and second appendage units extending outwardly from and spaced from one another along one side of said optical portion, and third and fourth appendage units extending outwardly from and spaced from one another along another side of optical portion generally opposite said one side, each appendage unit including a first relatively rigid member depending from said optical portion, said first member including a first part connected to said optical portion and oriented away from said optical

plane of said optical portion, said first part of said first member extending outwardly from said optical portion, said first member further including a second part connected to said first part and oriented, in relation to said first part, toward said optical plane said second part of said first member extending outwardly from said first part and from said optical portion, and, a second relatively flexible member connected to said second part of said first member and extending outwardly therefrom and outwardly in relation to said optical portion further than said first relatively rigid member, each relatively flexible member including an open loop defining a terminal end part for contacting eye tissue, said open loops of said first and second appendage units rotationally turned in opposite directions toward one another, and said open loops of said third and fourth appendage units rotationally turned in opposite directions toward one another.

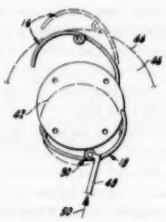


4,536,896

INTRAOCULAR LENS WITH APPENDAGE MANIPULATION LOOP

Timothy Bittner, Duarte, Calif., assignor to Ioptex Inc., Azusa, Calif.

Filed May 17, 1983, Ser. No. 495,415
Int. Cl.³ A61F 1/16, 1/24
U.S. Cl. 623—6 **5 Claims**



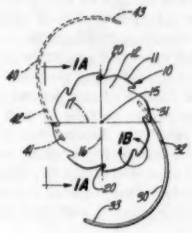
1. An intraocular lens comprising:
a. an optical portion; and
b. at least one resilient appendage having a first end portion connected to and extending from said optical portion, a second end portion intended for contacting the anatomy of the eye, and an intermediate portion between said first and second end portions, said intermediate portion of said at least one appendage including a substantially closed loop, said substantially closed loop including a continuous member which turns through an arc of at least one hundred eighty degrees, said continuous member forming a coil having an upper portion and an adjacent lower portion provided with an overlapped area, said continuous member of said closed loop being fixed against movement relative to said first end portion of said at least one appendage such that the exertion of force on said at least one appendage results in bending of said first end portion relative to said optical portion.

4,536,897

INTRAOCULAR LENS

Robert M. Powell, 686 Crestwood Dr., Gaylord, Mich. 49735

Filed Jul. 8, 1983, Ser. No. 511,849
Int. Cl.³ A61F 1/16, 1/24
U.S. Cl. 623—6 **14 Claims**



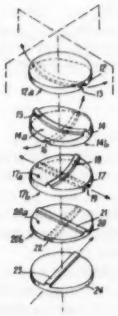
1. An intraocular lens useful for implantation or positioning in the chamber of an eye after capsular extraction, comprising:
an imperforate lens optic having an anterior face and a posterior face, the circumference of each face having a continuous curving common edge configured with at least one continuous curving axial socket recess open to said edge and faces, and haptic support means adapted for rotating the lens and centering the lens optic on the optical axis, the socket recess having bearing surfaces of a size adapted to receive and accommodate in close-fitting relation by open edge-access the distal end of a surgical tool to thereby enable the lens to be rotated or dialed and thus moved by the tool in the plane of the lens for positioning of the lens in a surgical procedure.

4,536,898

DEVICE FOR THE ALIGNMENT RESEARCH, ALIGNMENT AND ORIENTATION OF PROSTHESIS OF THE LOWER LIMBS

Michel R. Palfray, Seurre, France, assignor to Etablissements Proteor, Dijon, France

Filed Mar. 7, 1983, Ser. No. 473,134
Claims priority, application France, Jul. 30, 1982, 82 13332
Int. Cl.³ A61F 1/02
U.S. Cl. 623—33 **12 Claims**



1. An adjustment setting device for alignment and angular orientation of a prosthetic device for a lower limb, the prosthetic device including an upper portion and a lower portion, said adjustment setting device comprising:
first adjustment means, connected to said upper portion and having a lower spherical surface;

second adjustment means, connected to said lower portion, and having an upper planar surface;

third adjustment means positioned between, and coacting with, said first and second adjustment means, said third adjustment means including an upper spherical surface and a lower planar surface;

the lower spherical surface of said first adjustment means and the upper spherical surface of said third adjustment means being relatively displaceable in three orthogonal planes to define means for angularly orienting said lower portion relative to said upper portion,

the upper planar surface of said second adjustment means and the lower planar surface of said third adjustment means being relatively displaceable in two orthogonal planes to define means for aligning said lower portion relative to said upper portion in any direction in the plane of coaction of the planar surfaces and means for immobilizing said orienting means after said angular orientation has been set,

whereby upon first setting said angular orientation of sad prosthesis upper and lower portions, alignment of said upper and lower prosthesis portions in orthogonal horizontal planes may be accomplished without a corresponding simultaneous change in position of the upper and lower portions in a third, vertical plane.

4,536,899

TOILET WITH FLUSHING DEVICE AND SELF-CLEANING SEAT

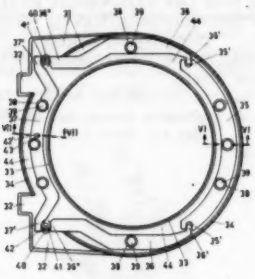
Erika Schnyder, Im Grubi, 9497 Triesenberg Fürstentum, Liechtenstein

Continuation-in-part of Ser. No. 232,514, Feb. 9, 1981, abandoned. This application Mar. 5, 1984, Ser. No. 586,326

Claims priority, application Switzerland, Feb. 28, 1980, 1583/80

Int. Cl.[3] **A47K** *13/30*

U.S. Cl. 4—233 **8 Claims**



1. A toilet, comprising:

a toilet seat comprising a stationary ring defining a toilet seat base and a rotatable ring defining a seat surface of the toilet seat;

said stationary ring having an outer circumference;

rollers arranged between said stationary ring and said rotatable ring and having upper portions;

said rollers conjointly defining a substantially circular path of travel for said rotatable ring in relation to said stationary ring and which path of travel extends substantially concentrically with respect to said outer circumference;

said rotatable ring being rotatably arranged upon said rollers for moving along said path of travel;

said stationary ring having an inner surface;

means for mounting each roller of said rollers translatably in a direction extending substantially transverse to said path of travel on said inner surface of the stationary ring and in a direction substantially normal to said inner surface;

said rotatable ring being provided with a substantially conical bearing surface;

said rollers being provided at said upper portions thereof with surfaces of revolution which are substantially conical; and

said substantially conical surfaces of revolution engaging in substantially straight-line contact said substantially conical bearing surface formed at said rotatable ring.

4,536,900

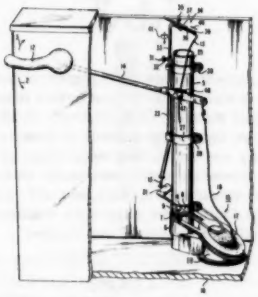
WATER CONSERVING FLUSH VALVE FOR TOILETS

Garrett P. Hayes, 72 Burlington Ave., Leonardo, N.J. 07737

Filed May 21, 1984, Ser. No. 612,619

Int. Cl.[3] **E03D** *5/094*

U.S. Cl. 4—324 **16 Claims**



1. A flush valve for use in a toilet tank, said flush valve comprising:

an overflow tube, having a base abutting against the bottom of the toilet tank and connected to an end of said overflow tube and extending to one side of said tube;

a valve pivotting about the overflow tube and abuttingly seating against said base to assume a closed position or pivotting upward from said base to assume an open position thereby directing water from said tank in order to produce a flush, said valve having a control arm extending away from said overflow tube in a direction substantially opposite to that of said base;

a flush handle, mounted to an outside surface of said tank, having an extension arm situated within said tank and extending towards said overflow tube;

means situated about the overflow tube proximate to said valve and being responsive to rotational movement of the flush handle in a pre-determined direction for forcing the valve to a desired position, wherein the forcing means comprises:

a cable connected at one end thereof to an end of the extension arm located near the overflow tube and connected at the other end thereof to said control arm, and

a conduit having two legs and mounted to said overflow tube and through which said cable is routed, the first leg extending laterally over a top end of said overflow tube and the second leg extending vertically downward and along said overflow tube, wherein each leg has a telescoping section for independently and appropriately adjusting the length and/or orientation of that section so that the cable assumes a substantially vertical orientation as it extends upward from the end of said extension arm and into the first leg of said conduit, whereby the flush valve can be readily installed in a wide variety of toilets without changing the flush handle existing therein.

4,536,901

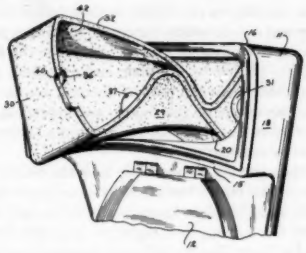
INSULATING LINER FOR A WATER CLOSET TANK

Robert A. Jones, and Jack R. Reichert, both of Kohler, Wis., assignors to Kohler Co., Kohler, Wis.

Continuation of Ser. No. 534,986, Sep. 23, 1983, abandoned. This application Apr. 17, 1985, Ser. No. 723,720

Int. Cl.³ E03D *1/00*

U.S. Cl. 4—416 **3 Claims**



1. An insulating liner for a water closet tank that has bottom and side tank walls and a top tank opening; said tank walls defining a tank water storage chamber, at least part of which is larger in horizontal cross sectional area than the top opening of the tank; said liner comprising:

bottom and side liner walls that are formed so as to be substantially coextensive with the interior surface of the tank bottom wall and tank side walls;

the liner walls normally being configured so that the horizontal cross sectional area defined by the exterior of the liner side walls at a certain height is greater than the cross sectional area of the tank top opening, and the liner side walls are suitable to lie against the interior of the tank side walls;

said liner being formed out of a flexible and resilient material so that the liner can be collapsed for insertion in the tank through the tank top opening, and then be released to resiliently return it to its normal configuration;

said liner having a horizontal cross section which defines at least one set of opposed liner side walls; and

said liner being sufficiently flexible and resilient so that the upper ends of the opposed liner side walls may be folded inwardly towards each other to permit the opposed side walls to touch each other along lateral sides of the folds, and then resiliently return to their normal position without substantial deformation of the liner.

4,536,902

TOILET ASSEMBLIES

Leland S. McGill, Portage, Ind., assignor to Richard G. Kinney, Merrillville, Ind.

Filed Sep. 27, 1982, Ser. No. 423,642

Int. Cl.³ A47K *3/022, 3/12*

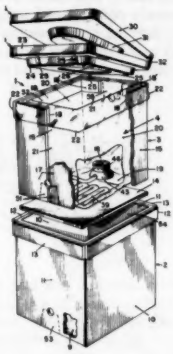
U.S. Cl. 4—476 **12 Claims**

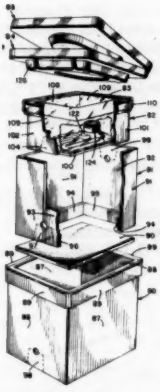
1. A toilet assembly for use with a removable flexible liquid-proof receptacle, comprising:

a structure including a seat, and means for receiving the flexible liquid-proof receptacle and for positioning said receptacle so that it opens upwards, said seat being mounted above said receptacle and provided with an opening for communication with said receptacle, said structure captivating said receptacle and substantially closing and sealing the interior, except for the opening of said seat;

said seat forming substantially the top of said structure and being formed of slightly compressible foam plastic material and said seat defining a downward tapered edge around the opening;

a cover for placement on said seat for substantially closing and sealing the opening in said seat and thus closing and sealing the interior of said receptacle; said cover having a downward projecting tapered marginal edge conforming to the shape of the opening of said seat for nesting against the tapered edges thereof to aid in sealing the opening





whereby the toilet assembly may be used, human body wastes discharged by the user through the opening in the seat into the removable flexible receptacle, and odors thereform contained within the assembly by placing the sealing cover over the seat between uses.

4,536,903

DEVICE FOR MANIPULATING INVALID BED PATIENTS

Leslie L. Parker, 4196 44th St., San Diego, Calif. 92105

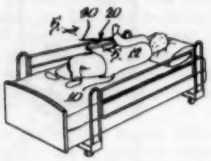
Filed Jul. 1, 1983, Ser. No. 510,340

Int. Cl.³ A61G *7/10*

U.S. Cl. 5—61 **5 Claims**

1. A device for manipulating bed patients into various positions of rest comprising a flexible, pliant sheet of porous fabric of a size to underlie the torso of the patient, said sheet of fabric including a central portion of a width approximately equal to the width of the patient's torso and of a length to underlie the patient's torso from approximately the shoulders to the buttocks, and end portions extending laterally outward from said central portion at an elevation to extend outwardly below the patient's arm pits, whereby the patient's arm and legs may be free from confinement when the device is in use, hand grip means on at least one end of said sheet adjacent a respective

side of the bed for moving the contiguous end portion of said sheet into partially encircling relation to the torso of the patient and for rolling the patient from a supine position into a position on one of the patient's sides, said hand grip means including a hemmed edge portion on said at least one end of said sheet defining a socket extending along substantially the full length of said end of said sheet, a renforcing member of a length approximately equal to the length of said end of said sheet removably inserted in said socket to rigidify said end of said sheet and to cause the same to move as a unitary whole despite the pliability of said sheet, and fastening means remov-



ably associated with said reinforcing member for fastening said end of said sheet to the bed for holding the respective end of said sheet to the bed in partially encircling relation to the patient's torso and for thereby holding the patient's body on its side in a selected position, said reinforcing member maintaining said sheet smooth and fully extended lengthwise throughout the length of said sheet both during a patient rolling movment and when the patient's torso is held in a selected position to insure uniform and comfortable engagement of said sheet with the patient's torso throughout the length of said sheet, said fastening means and said reinforcing member being removable from said sheet to facilitate laundering of said sheet.

4,536,904

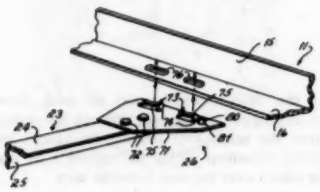
FOLDABLE BED FRAME

Larry W. Whitehead, Lexington, N.C., assignor to Leggett & Platt, Incorporated, Carthage, Mo.

Filed Oct. 7, 1982, Ser. No. 433,358

Int. Cl.³ A47C *19/02*; F16B *9/00*

U.S. Cl. 5—201 **5 Claims**



3. In a bed frame having a pair of elongate side rails and a pair of cross-rails, the cross-rails each having two elongate sections each pivotally secured at one end to a different side rail adjacent an end of the respective side rail, the improvement comprising:

releasable locking means for rigidly interconnecting two opposed cross-rail sections, the releasable locking means comprising,

a manually graspable locking member rotatably mounted on one cross-rail section, the member having a stem and an elongate segment extending radially from the stem, the cross-rail section having a first aperture spaced from the locking member,

a protrusion on the other cross-rail section, the cross-rail section having a second and elongate aperture spaced from the protrusion,

the locking member being receivable in a first orientation in the second and elongate aperture and the protrusion being receivable in the first aperture when the two cross-rail sections are aligned and juxtaposed such that the cross-rail sections are rigidly connected with a positive lock formed by rotating the locking member to a second orientation;

an elongate center brace having two ends, the center brace being joined at its ends to the opposed rails of the bed frame by means of a lock plate mechanism, the lock plate mechanism comprising,

a plate having two fingers formed thereon in laterally spaced relation, the fingers receivable in slots formed in each of the opposed rails to which the center support is joined, the slots being in equivalent spaced relation to the fingers,

a locking pin carried by the plate and extending generally perpendicular from the surface thereof, the locking pin being adjacent one of the fingers and extending through an aperture in the plate, the pin being urged through the aperture by resilient means,

the lock plate serving to positively lock the center brace in position on the rails when the fingers are inserted through the slots and the plate laterally shifted in one direction whereby the locking pin registers in a slot which has received a finger thereby preventing lateral motion of the center brace in the opposite direction;

a pair of headboard brackets, each attachable to a side reail adjacent the end thereof, each side rail having a pair of outwardly facing laterally spaced protrusions thereon, the headboard bracket comprising,

an L-shaped member having a longitudinal and transverse part,

plural elongate slots formed on the transverse portion for receiving a headboard attaching means,

a pair of upper and laterally spaced slots,

a pair of lower and laterally spaced slots,

the pairs of slots being each so spaced to receive the side rail protrusions therein, the protrusions having means thereon to engage the bracket against movement in an outward direction.

4,536,905

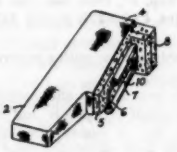
ANTI-SNORE PILLOW

Damian G. DeSantis, 1911 Greenfield Dr., El Cajon, Calif. 92021

Filed Feb. 23, 1984, Ser. No. 582,826

Int. Cl.³ A47C *20/00*

U.S. Cl. 5—434 **5 Claims**



1. A pillow for controlling the position of the head of a reclining subject to prevent snoring which comprises:

a resilient support pad for said subject's head;

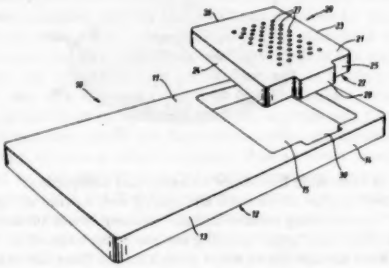
a pair of extensions of said support pad forming a slot around said subjects shoulders; and

a stiffening brace imbedded in the middle of said support pad, directly aligned with said slot.

4,536,906
MATTRESS WITH APERTURED INSERT

Sydney A. Varndell, Andover; Douglas R. Lawson, Minster, and Michael W. Fountain, Gillingham, all of England, assignors to Thomas Jourdan PLC, Windson, England

Filed Apr. 28, 1983, Ser. No. 489,386
Claims priority, application United Kingdom, Jun. 8, 1982, 8216656
Int. Cl.³ A47C *27/14;* A47D *7/00*
U.S. Cl. 5—468 **5 Claims**



1. A mattress comprising:

a foam mattress body with a main portion and a head portion, and a top surface and a bottom surface; and

a removable foam insert having a top face and a bottom face, and, distributed in a predetermined region thereof, a plurality of perforations each extending from the top face through to the bottom face;

the mattress body having an aperture in the head portion for receiving the insert, which aperture opens out on the top surface, extends from the top surface to the bottom surface of the mattress body and has a continuous perimeter shaped to correspond generally to the outline of the insert;

the thickness of the insert being such that the top face thereof lies substantially flush with the top surface of the mattress body, and the arrangement of the perforations providing air passages communicating with the underside of the mattress for ventilation of the top face of the insert, the perforations being grouped asymmetrically relative to the outline of the insert, and the insert and the aperture being so correspondingly shaped that the insert can only be fitted in a required orientation, the insert being generally rectangular, and having a key portion projecting from one side, the aperture having a correspondingly shaped recess for receiving the key portion.

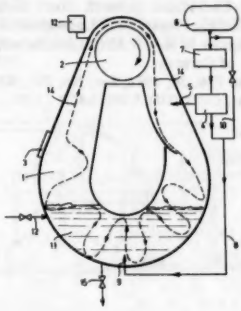
4,536,907
PROCESS FOR EFFECTING AN ACCELERATED NEUTRALIZATION OF CELLULOSE TEXTILE SUBSTRATES IMPREGNATED WITH ALKALINE HYDROXIDE

Jean-Pierre Zumbrunn, Eaubonne; Jean Levielle, Chaource; André Thomas, Troyes, and Francoise Grangette, Bourg-la-Reine, all of France, assignors to L'Air Liquide, Societe Anonyme Pour L'Etude Et L'Exploitation Des Procedes Georges Claude, Paris, France

Filed Nov. 23, 1983, Ser. No. 554,797
Claims priority, application France, Nov. 29, 1982, 82 19963
Int. Cl.³ D06B *3/10*
U.S. Cl. 8—149.1 **25 Claims**

25. A process for neutralizing a cellulose textile substrate, impregnated with alkaline hydroxide which is at least in part fixed on the cellulose in the form of alkali-cellulose, comprising

squeezing the wet cellulose textile to remove aqueous alkaline hydroxide liquid therefrom, thereby leaving a wet cellulose textile;



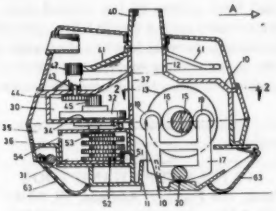
rapidly neutralizing said wet cellulose textile to a pH of at most 8.3 by contacting said wet cellulose textile with a neutralizing fluid containing carbon dioxide; and

rinsing said neutralized cellulose textile with water.

4,536,908
SUCTION CLEANERS

Johann N. Raubenheimer, Bedfordview, South Africa, assignor to Peacock Investments (Proprietary) Limited, Johannesburg, South Africa

Filed Mar. 30, 1983, Ser. No. 480,360
Claims priority, application South Africa, Apr. 2, 1982, 82/2293
Int. Cl.³ E04H *3/20*
U.S. Cl. 15—1.7 **6 Claims**



1. A suction cleaner head for use on a submerged surface comprising:

a turbine housing,

a suction inlet in the base of the housing,

a shaft journalled in the housing,

a turbine mounted on the shaft,

a pair of rockers for supporting the housing at least partially on a surface, each rocker being pivoted to the housing,

a pair of eccentrics on the turbine shaft, each eccentric being engaged with one of said rockers for providing a rocking action to a rocker,

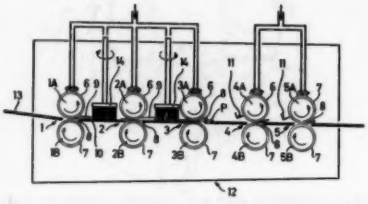
a pair of spaced apart friction feet pivoted to the underside of each rocker for contacting the surface,

means for resiliently biasing each of said feet to an inclination so that each of said feet can perform a limited rocking motion relatively to the rocker when forces directed towards the surface are applied to the rocker, and an outlet from the housing adapted to be connected to a flexible hose.

4,536,909
APPARATUS FOR TREATING FLEXIBLE PRINTING PLATES PRODUCED BY PHOTOCHEMICAL METHODS

Arnulf Bürger; Karl-Heinz Scharff; Kurt Geiger; Günther Schnee, and Hartwig Pieper, all of Ludwigshafen, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 24, 1984, Ser. No. 583,205
Int. Cl.[3] G03D *5/06;* A46B *13/04*
U.S. Cl. 15—4 3 Claims



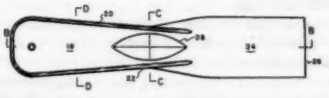
1. An apparatus for treating flexible printing plates produced by a photochemical method, in particular those produced from photopolymerizable substances and exposed with actinic light, which apparatus comprises a housing through which the plates are transported and in which they are washed out and cleaned, said housing including five roller pairs which are mutually spaced in the direction of transport of the plates, table sections which are located between said roller pairs and over which the plates are transported by the rollers, and brushes located between the roller pairs, rotating about axes normal to said table sections and having washout liquid supplied thereto, the first three pairs of rollers effecting transportation while the two subsequent pairs of rollers effect cleaning and partial drying in addition to transportation,

wherein the three upper transport rollers and the first upper cleaning roller downstream of the pairs of transport rollers are covered with velour, the corresponding lower rollers and both rollers of the second pair of cleaning rollers are covered with a textile fabric, and peeling members are located, parallel to the roller axis, at all of the upper rollers, the peeling members at the first and second upper transport rollers being equipped with hold-down means.

4,536,910
SPATULA TYPE HAND TOOL

Ronald M. Clark, 105 Factory, Addison, Ill. 60101

Filed Mar. 12, 1982, Ser. No. 357,724
Int. Cl.[3] B05C *17/10*
U.S. Cl. 15—104 S 6 Claims



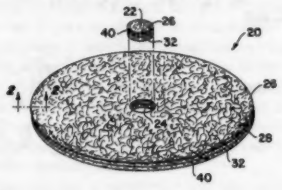
1. An improved spatula type hand tool of the character having an integrally formed handle portion and blade portion with a transition area therebetween and wherein said improvement comprises,

a reinforcing blister having a compound curved configuration with an apex disposed substantially on the longitudinal axis of said tool, across said transition area, extending at opposite ends thereof into said handle and blade portions respectively, and of a thickness which is relatively less at said apex than at the base thereof.

4,536,911
FLOOR CLEANING PAD

Peter G. Demetriades, 2118 Coleman Pl., Henderson, N.C. 27536

Filed Dec. 12, 1984, Ser. No. 680,826
Int. Cl.[3] A47L *13/16*
U.S. Cl. 15—230.12 21 Claims



1. A reversible hard-floor cleaning pad comprising:

a first porous non-woven air-layered web having an upper, floor-cleaning surface and an opposing lower surface,

said first web upper cleaning surface being adapted to clean hard surface floors when placed on the floor and rotated about a vertical axis passing through the center of said first web at super high speeds of at least 1000 revolutions per minute,

a second porous non-woven air-layered web having a lower, floor cleaning surface and an opposite upper surface,

said second web lower cleaning surface being adapted to clean hard surface floors when placed on the floor and rotated about said vertical axis at super high speeds of at least 1000 revolutions per minute,

said second web being disposed parallel to and spaced from said first web with said first web lower surface facing said second web upper surface,

a flexible wet-laid nonwoven strata layer having uniform directional strength and an upper layer surface and an opposite lower layer surface,

said strata layer being disposed between said first web and said second web, and

a bonding means for bonding said first web lower surface directly to said upper layer surface and said second web upper surface directly to said lower layer surface,

said first web, said strata layer, said second web, and said bonding means defining a hard-floor cleaning pad having general uniform strength in all directions perpendicular to said vertical axis, so as not to distort at said super high speeds.

4,536,912
COUPLER DEVICE FOR FLOOR MAINTENANCE PAD OR THE LIKE

Terrance J. Malish, 2520 Red Fox Pass, Willoughby, Ohio 44094

Filed Nov. 14, 1983, Ser. No. 550,942
Int. Cl.[3] A47L *11/14, 11/40*
U.S. Cl. 15—230.17 4 Claims

1. A coupler device of the type for detachably mounting a floor maintenance pad, such as for cleaning, stripping, polish-

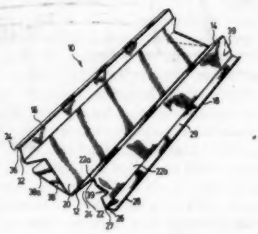
ing, scrubbing or the like, to a pad holder member for use with a floor maintenance machine, said coupler device comprising a unitary body member defining a centrally disposed hub portion for centering said pad relative to said pad holder, said hub portion having a base portion extending radially outwardly at one end and adapted for detachable securement to said pad holder member, said hub portion including at its other end a radially extending flange portion with said base and flange portions being laterally spaced apart a distance sufficient to accommodate the transverse thickness of said maintenance pad therebetween, and said hub portion including a plurality of tine elements extending radially therefrom and disposed for penetrating frictioaal coacting engagement with the material of said maintenance pad to restrain rotational movement of said maintenance pad relative to said pad holder and to frictionally center and lock said pad relative to said pad holder during usage of said floor maintenance machine, wherein said flange portion includes arcuate and flat portions defining a maximum transverse dimension which is greater than a central opening formed in said maintenance pad and a minimum transverse dimension that is less than said maximum transverse dimension to facilitate installation of said maintenance pad relative to said hub portion whereby outer peripheral edge portions of said flange portion are disposed in overlieing relationship relative to the corresponding inner peripheral edge defined by the hole in said maintenance pad.

4,536,913

PAINT GUARD HAND TOOL

Janusz Morawski, 169 Dolomite Dr., Downsview, Ontario, Canada

Filed Jul. 17, 1984, Ser. No. 631,813
Int. Cl.³ B05C *11/00*
U.S. Cl. 15—257 R **10 Claims**



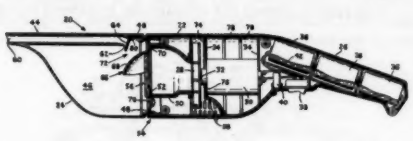
1. A paint guard hand tool comprising:
a base panel, defining upper and lower surfaces, forward and rearward edges and two ends;
a ridge formation extending generally upwardly from the forward edge of the base panel, the ridge formation including a front panel having a lower edge;
first trough-defining member means extending forwardly from the front panel, the first trough-defining member means defining an upwardly directed trough and including an upwardly and forwardly directed first lip;
a generally upwardly and rearwardly directed wall member extending from the rearward edge of the base panel;
second trough-defining member means extending generally rearwardly from the upper edge of the wall member, the second trough-defining member means defining a downwardly directed trough and including a downwardly and rearwardly directed second lip, and,
base stop members extending downwardly from the base panel.

4,536,914

WET-DRY VACUUM CLEANER

Morris M. Levine, Scarsdale, N.Y., assignor to CIC Int'l Corp., New York, N.Y.

Filed Mar. 7, 1984, Ser. No. 587,227
Int. Cl.³ A47L *5/24*
U.S. Cl. 15—344 **10 Claims**



1. A vacuum cleaner comprising:
a motor;
a generally cylindrical housing having a front end and a back end, said housing enclosing said motor;
a blower driven by said motor and disposed ahead of said motor within said housing, rotation of said blower producing a vacuum;
a canister removably attached to the front end of said housing, said canister having an intake nozzle for receiption of dirt, liquid and air drawn into said nozzle in response to a vacuum developed by said blower;
said canister including a storage chamber disposed alongside said nozzle for the storage of matter drawn in via said nozzle, said canister being closed off at a front end thereof for holding said matter when said canister is in an erect position corresponding to a vertical orientation of the longitudinal axis of said nozzle;
deflection means disposed at an interface between said canister and said housing for deflecting liquid and dirt drawn in via said nozzle away from said housing and into said chamber;
said nozzle comprising a posterior port by which said nozzle communicates with said chamber, and said deflection means comprising a flexible closure member fully closing off said posterior port of said nozzle, said closure member being sufficiently flexible to deflect away from said posterior port under vacuum forces to open said posterior port, said closure member being oriented for direction of fluids transversely toward a central portion of said chamber; and wherein
said closure member, upon a closing of said posterior port, secures said storage chamber against a spilling of liquid therefrom during erect and inclined orientations of said canister.

4,536,915

MACHINE FOR TRUING ELECTRICAL COLLECTORS AND THE LIKE

Jean Guglielmo, 58 Rue Pasteur, 69300 Caluire, France

Filed Mar. 17, 1983, Ser. No. 476,282
Claims priority, application France, Mar. 22, 1982, 82 05261
Int. Cl.³ A47L *7/04*
U.S. Cl. 15—345 **12 Claims**

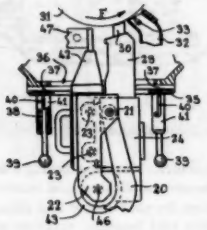
1. A machine for truing electrical connection members of a rotor rotatably mounted with respect to non-rotating casing parts of electrical machinery such as a traction motor, the machine having a tool holder system attachable to said non-rotating parts and comprising:
a first carriage located between the machinery and supported to roll in a longitudinal direction;
a second carriage supported on the first carriage and operative to roll in a transverse direction;
a turret borne by the second carriage and operative to rotate about a vertical axis;
arm means articulated at one end to the turret about a substantially horizontal axis;

a first support articulated about a horizontal axis to the arm means at the other end thereof, and rotatable about a vertical axis;

a second support articulated to the first support about a substantially horizontal axis;

means for fixing the second support to a non-rotating part of the machinery;

a tool-holder carriage borne by the second support to move with respect thereto in a substantially horizontal direction;



means for driving the tool-holder carriage horizontally with a reciprocation motion;

a grinding tool borne by said tool-holder carriage;

and means for advancing said tool-holder carriage toward the rotor members to be trued.

11. The machine of claim 1, wherein the machine further includes suction means adjacent to the grinding tool for collecting grinding dust, and a blowing nozzle at said suction means and operative to direct an air jet against the member being ground.

4,536,916

DOOR HOLDER-CLOSER HAVING A CONTROL SIGNAL OPERATED HOLD-OPEN FUNCTION AND A MECHANICAL OVERRIDE FACILITY

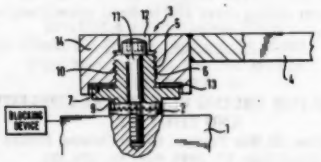
Ralf Storandt, Leonberg, and Karl Mettenleiter, Weil der Stadt, both of Fed. Rep. of Germany, assignors to Geze GmbH, Fed. Rep. of Germany

Filed Oct. 17, 1983, Ser. No. 542,730

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1982, 3246457

Int. Cl.³ E05F *15/20*

U.S. Cl. 16—48.5 **8 Claims**



1. A door holder-closer having a control signal operated hold-open function and a mechanical override facility, said door holder-closer being adapted to hold a door in any desired open position to which it is moved from a closed position and comprising a housing for mounting on one of a door and fixed structure adjacent thereto; a unit for generating a closing force contained in said housing; a drive axle extending from said unit out of said housing; lever means connectable between said drive axle and the other one of said door and said fixed structure; a mechanically overridable clutch disposed between said lever means and said drive axle for transmitting torque from said lever means to said drive axle to rotate the same on opening of said door, whereby to energize said unit; and a blocking device for blocking said unit to generate a holding force and prevent said unit from moving said door in the door closing direction, said blocking device being capable of being switched in and out by control signals; wherein said overridable clutch between said lever means and said drive axle comprises first and second interengaging threaded elements, a first abutment provided on said first threaded element, a second abutment provided on said second threaded element and confronting said first abutment, wherein, in said open position of said door, said confronting first and second abutments are in frictional engagement with one another, thus generating a frictional locking force and frictionally locking said lever means to said drive axle; wherein said threaded elements are handed so that manual forced closing movement of said door from a said open position to said closed position overcomes said frictional engagement without overcoming said holding force and thus produces relative rotation of said first and second threaded elements and separation of said confronting first and second abutments, thus permitting manual relative rotation between said drive axle and said lever means to thereby manually move the door toward said closed position, and wherein said frictional locking force is less than said holding force.

4,536,917

FURNITURE HINGE HAVING A SPRING BIASED PIVOTING PRESSURE MEMBER

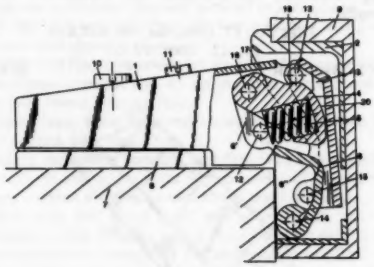
Erich Röck, Höchst, and Klaus Brüstle, Lauterach, both of Austria, assignors to Julius Blum Gesellschaft m.b.H., Höchst, Austria

Filed Jul. 7, 1983, Ser. No. 511,750

Claims priority, application Austria, Nov. 16, 1982, 4161/82

Int. Cl.³ E05F *1/14*

U.S. Cl. 16—288 **4 Claims**



1. A hinge comprising:

a hinge arm adapted to be mounted on an article of furniture and having first and second hinge axles;

a hinge casing adapted to be mounted on a door of the article of furniture and having third and fourth hinge axles;

an internal hinge link in the form of a two-arm lever including a first arm having first and second ends pivotally mounted on said first and third hinge axles, respectively, and a second arm extending from said first hinge axle into said hinge arm;

an external hinge link having first and second ends pivotally mounted on said second and fourth hinge axles, respectively;

a pressure member pivotally mounted directly to said second arm of said internal hinge link on a seperate pivot at a position spaced toward said hinge arm and spaced from said first and second hinge axles, said pressure member having a contact surface;

spring means for continuously abutting said first hinge axle and for urging said pressure member to pivot about said separate pivot to maintain said contact surface in direct abutment with said second hinge axle throughout both the open and closed positions of the hinge; and

said pressure member always extending from said position spaced from said first and second hinge axles in a direction between said first and second hinge axles and toward said hinge casing to a position between the second and fourth hinge axles, and wherein said pressure member is adjacent said hinge casing in the closed position.

4,536,918

TORSION BAR VEHICLE DOOR HINGE ASSEMBLY WITH HOLD OPEN MECHANISM

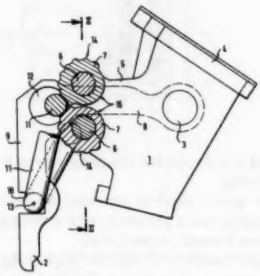
Ernst Brockhaus, Remscheid-Hasten, Fed. Rep. of Germany, assignor to Ed. Scharwächter GmbH & Co. KG, Remscheid, Fed. Rep. of Germany

Filed Aug. 9, 1983, Ser. No. 521,714

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1982, 3229766

Int. Cl.³ E05D *11/10*

U.S. Cl. 16—308 **11 Claims**



1. A door hinge assembly including a door stop mechanism for a motor vehicle comprising: a first and a second hinge member mounted relative to each other for pivotal motion about a hinge axis to mount a door for swinging movement between an open and a closed position; a torso bar spring supported at one of said hinge members, said torsion bar spring having a load arm projecting over the height of said hinge assembly and directed parallel to said hinge axis; a pair of abutment rollers rotatably mounted at the other of said hinge members at a position spaced from said hinge axis; said abutment rollers being located to be always substantially simultaneously engaged by said load arm of said torso bar spring at a position always between said rollers to form a catch device at least for said open position of said door; each of said abutment rollers being formed to comprise a smaller diameter portion and a larger diameter portion and bearing means rotatably mounting said abutment rollers about fixed respective bearing axes, said bearing axes being spaced a fixed distance from each other, wherein said distance is always smaller than said larger diameter portion of said rollers.

4,536,919

BREAST PROCESSOR

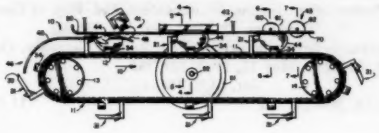
Miles L. Cashwell, Marietta, and Worthy D. Peterman, Cumming, both of Ga., assignors to Cagles', Inc., Atlanta, Ga.

Filed Mar. 18, 1983, Ser. No. 476,799

Int. Cl.³ A22C *21/00*

U.S. Cl. 17—11 **3 Claims**

1. In apparatus for cutting poultry carcasses into segments including a surface conveyor for movement along a predetermined path comprising parallel conveyor halves which define a space therebetween, a plurality of carcass supports mounted at intervals along said conveyor for carrying poultry carcasses along the path, each of said carcass supports including a carcass support bar extending along said path, said carcass support bar being approximately V-shaped in cross section whereby the previously eviscerated carcass of a bird is mounted on a carcass support with the carcass support bar extending into the eviscerated cavity of the bird and the back bone of the carcass is supported by the V-shaped carcass support bar, a cutting station positioned along the path including a rotatable backbone-cutting disk for cutting longitudinally through the backbones of carcasses, said backbone cutting disk being positioned above the path and located in a plane parallel to the path and extending toward the path of the carcass support bar for cutting the backbone of a carcass, the improvement therein of backbone guide means extending on opposite sides of the backbone-cutting disk for bearing downwardly against the carcass



on opposite sides of the backbone to press each carcass downwardly to urge the backbone of the carcass into the V-shaped carcass support bar and to guide the backbone into the backbone-cutting disk, and a breast-cutting disk protruding upwardly through said space between said conveyor halves for engaging and cutting the carcasses moved by the conveyor, the improvement therein including a breast support bracket carried by said surface conveyor comprising a pair of bracket elements mounted on the conveyor halves at positions adjacent each carcass support and the bracket elements together forming a surface against which the breast of a poultry carcass rests.

4,536,920

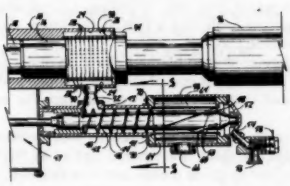
TWO STAGE MEAT STRAINER

Andre G. Amersfoort, Montfoort, Netherlands, assignor to Boldt Industries, Inc., Des Moines, Iowa

Filed Oct. 11, 1983, Ser. No. 540,653

Int. Cl.³ A22C *17/00*

U.S. Cl. 17—46 **12 Claims**



1. A method for separating and removing meat from bones by utilizing a pair of first and second communicating presses, each press having a cylindrical pressure chamber for containing meat and bones to be separated, a sealing wall for closing off one end of the pressure chamber, a cylindrical lining sleeve within the pressure chamber having openings extending therethrough, the openings in the sleeve of the second press being smaller in diameter than the openings of the sleeve in the first press and a collector channel in the pressure chamber surrounding said lining sleeve, said method comprising:

introducing a combination of meat and bones to be separated into said pressure chamber of said first press,

exerting a pressure on the contents of said pressure chamber of said first press whereby said combination is partially separated by forcing meat and some bone outwardly through the openings of said sleeve of said first press into said collector channel of said first press,

advancing the partially separated combination of meat and bones in said collector channel of said first press into said pressure chamber of said second press,

compressing the partially separated combination of meat and bones within said pressure chamber of said second press whereby meat is forced outwardly through the openings of said sleeve of said second press into said collector channel of said second press so as to further separate the meat from the bone.

4,536,921

CABLE CLAMP

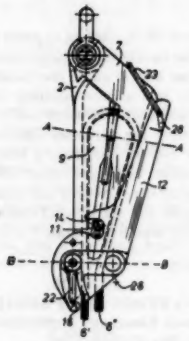
Richard Brendel, Pottenstein, and Herbert Conrad, Bayreuth, both of Fed. Rep. of Germany, assignors to Geroh GmbH, Mechanische Systeme, Waischenfeld, Fed. Rep. of Germany

Filed Oct. 27, 1982, Ser. No. 436,912

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1981, 3143217; May 12, 1982, 3217885

Int. Cl.³ F16G *11/00*

U.S. Cl. 24—132 WL **11 Claims**



1. A cable clamp with clamping jaws, a clamping wedge and a clamping closing and locking device characterized by:

(a) a base having a fastening device for supporting the clamp at the upper end and including a clamping surface for engaging a cable and a bolt at the lower end with a nut tightenable thereon,

(b) an angular-shaped clamping jaw pivotally attached on a pivot at the upper end of the base to open and close therewith and including a clamping surface for engaging said cable,

(c) a clamping wedge mounted to slide between said base and said clamping jaw toward and away from said upper end including guide means and a carrier bolt thereon, said wedge movable upwardly toward a cable releasing position and downwardly toward a cable clamping position, and

(d) a breechblock pivotally mounted on a second pin at the lower end of said clamping jaw having first surfaces for driving the carrier bolt and clamping wedge downwardly between said base and jaw into said cable clamping position wherein said cable is wedged and held by clamping surfaces on said jaw and base against said wedge when said breechblock is pivoted towards a closed position, and including second surfaces forming a slot open at the end adapted to engage and receive said bolt on said base for moving the lower ends of said clamping jaw and base toward each other to close said clamp against said cable on said wedge as said breechblock is pivoted towrd a closed position,

said breechblock including a closing depression adjacent said slot for receiving said nut when tightened on said bolt to hold said base and jaw in a cable tensioning position intermediate said open and closed positions wherein tension can be applied to said cable by pulling on a free end of said cable, and further including a locking depression adjacent an inner end of said slot for receiving said nut when tightened on said bolt for securing said base and jaw in said cable clamping position tightly against a cable on said wedge, said second surfaces forming an angle of 82° to 88° with a connecting line running between said bolt on said base and said second pin when said clamp is in said cable clamping position.

4,536,922

ATTACHMENT DEVICE FOR A DECORATIVE ARTICLE

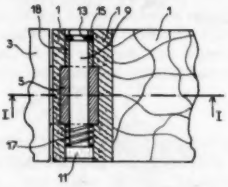
Gerard Brassoud, Faverges, France, assignor to S. T. Dupont, Paris, France

Filed Nov. 4, 1983, Ser. No. 549,343

Claims priority, application France, Nov. 4, 1982, 82 18501

Int. Cl.³ A44C *5/18*

U.S. Cl. 24—265 B **14 Claims**



1. An attachment device for attaching a strap to a decorative article, comprising:

at least one lateral support provided on said article, said lateral support being provided with a throughgoing bore;

a loop portion formed on said strap;

a shaft slidably mounted in said throughgoing bore of said lateral support, said shaft also passing through said loop portion of said strap;

an enlarged head portion provided on a first end of said shaft;

biasing means for biasing said head portion on said first shaft end away from said lateral support; and

removable locking means for engaging a second end of said shaft and thereby preventing withdrawal of said shaft from said bore provided in said lateral support;

said shaft being movable between two extreme positions under the biasing action of said biasing means, a first position achieved by moving said shaft against said biasing force and wherein said removable locking means is accessible outside of said attachment device for removal thereof, and a second position achieved by displacement of said shaft under the influence of and in the direction of said biasing force and wherein said locking means is secured and withdrawn to a position interior to said attachment device and is therefore substantially nonaccessible.

4,536,923

SEPARABLE SLIDE FASTENER

Shoetsu Murakami, Toyama, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Continuation of Ser. No. 324,818, Nov. 25, 1981, abandoned. This application Jan. 23, 1984, Ser. No. 572,615

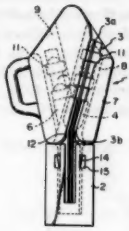
Claims priority, application Japan, Dec. 26, 1980, 55-186401

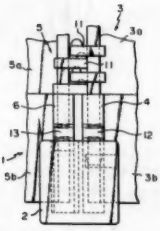
Int. Cl.³ A44B *19/00*

U.S. Cl. 24—433 **3 Claims**

1. A separable slide fastener comprising a pair of longitudinally extending stringer tapes with fastener elements on one edge of each stringer which interlock when brought together transversely in the plane of the fastener including a retainer pin secured to the end of the tape of one of the stringers and connected to a retainer, and a separable plastic pin sourced to the end of the tape of the other stringer annd longitudinally removably received in the retainer, characterized in that at least the separable pin is provided with a thin portion of reduced

dimension extending transversely across the pin at an intermediate portion thereof adjacent to, but outside the retainer when





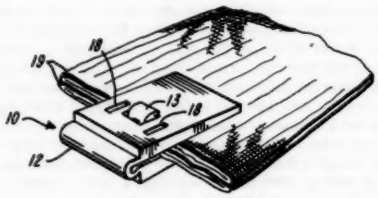
the separable pin is received therein making the separable pin flexible at such thin portion.

4,536,924

ONE PIECE CLAMPING DEVICE

Patrick Willoughby, 712 Elberon Ave., Dayton, Ohio 45403

Filed Mar. 5, 1984, Ser. No. 586,267
Int. Cl.³ A44B 9/10; G09F 3/08
U.S. Cl. 24—487 **8 Claims**



1. A one piece adjustable clamping device for paired or matching articles of clothing comprising

(A) A proximal, flexible hinge portion of lesser thickness than medial and distal portions;

(B) distal portions having interior, non-penetrating substantially flat gripping surfaces; and

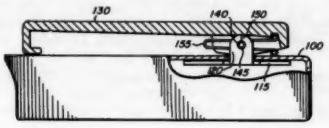
(C) male and female medial portions, said male medial portion having a male locking member one surface of which is toothed and the other surface of which is non-toothed and said female medial portion having a female locking cavity and a locking ledge(s) extending therein, wherein said toothed surface of said male locking member meshes with said locking ledge(s); said male medial portion includes a male guide(s) and said female medial portion includes a female guide channel(s) for receiving said guide(s) and a spur to guide the non-toothed surface of said male locking member into position in said female cavity and retain it.

4,536,925

BELT CLIP ASSEMBLY WITH A CONTROLLED FAILURE MODE

Nancy G. Boothe, Brighton, Mass., and Anthony M. Potts, Lauderdale Lakes, Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 11, 1983, Ser. No. 540,972
Int. Cl.³ A45F 5/02
U.S. Cl. 24—511 **7 Claims**



1. A mounting clip assembly having a controlled mode of failure, comprising:

a housing member including an inner surface and an outer surface;

a mounting clip;

a body member adjacent said inner surface of said housing member;

a pair of tabs attached to said body member and projecting substantially perpendicular therefrom, each of said tabs including an outer edge and an aperature, said tabs projecting through slots in said housing member from said inner surface to said outer surface;

pivot means attached to said mounting clip, for pivotably attaching said mounting clip to said body member; and

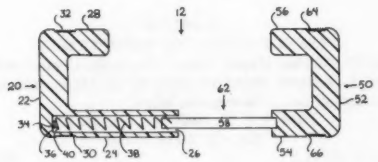
said tabs include controlled failure means for allowing said mounting clip and said housing member to separate upon application of a predetermined force between said housing member and said clip thereby minimizing damage to said housing member and said mounting clip.

4,536,926

SKI CLIP HOLDING DEVICE

Victor Pantaleo, 7854 Redondo La., Orland Park, Ill. 60462

Filed Jan. 4, 1983, Ser. No. 568,043
Int. Cl.³ A44B 21/00; E05B 73/00
U.S. Cl. 24—523 **15 Claims**



1. A generally large C-shaped ski clip for holding skis in pairs, said ski clip having a hollow section and a rod section joined together to form said generally large C-shaped clip, wherein:

(a) said hollow section is generally of a J-shape, said hollow section comprising a long, hollow arm of a generally square cross-section, a solid forward leg generally parallel to said long, hollow arm, a trunk connecting a first end of said long, hollow arm with a first end of said solid forward leg, said trunk being substantially perpendicular to said long, hollow arm and said solid forward leg;

(b) said rod section is generally of a small C-shape and combines with said J-shape to form said large C-shape;

(c) a rod is secured to one end of said rod section, and is slideably mounted and spring secured within said long hollow arm;

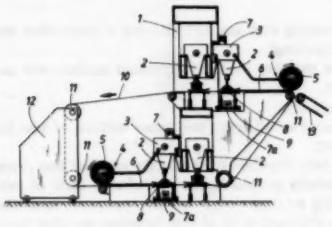
(d) said ski clip and said rod are of generally square cross-section; and

(e) said rod and said hollow section made in a male-female relationship.

4,536,927
APPARATUS FOR MANUFACTURING ENDLESS NEEDLED PAPER MACHINE FELTS

Günther Feyerl; Klaus Minichshofer, both of Linz, and Hans G. Pum, Wels, all of Austria, assignors to Textilmaschinenfabrik Dr. Ernst Fehrer Aktiengesellschaft, Leonding, Austria

Filed Oct. 31, 1983, Ser. No. 547,399
Claims priority, application Austria, Dec. 10, 1982, 4494/82
Int. Cl.³ D04H *18/00*
U.S. Cl. 28—110 **3 Claims**



1. In apparatus for manufacturing an endless needled paper machine felt up to a predetermined maximum width, the felt comprising at least one ply formed by a plurality of overlapping loops of a sliver web, which apparatus comprises

a needling machine having a working width equal to said predetermined maximum width and

a sliver web feeder operable to feed a sliver web to said needling machine, wherein the improvement comprises

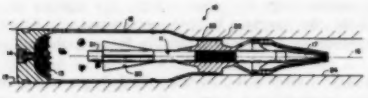
a needling device of smaller working width than the needling machine between said needling machine and said sliver web feeder, the needling device and the feeder having the same working width, and

means for reciprocating the needling device with the feeder in unison throughout the working width.

4,536,928
MANUFACTURE OF PROJECTILES

Roger W. Nicklas, Hamel; John E. Reynolds, Crystal, and Randall L. Schiestl, Brooklyn Park, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 17, 1983, Ser. No. 552,651
Int. Cl.³ B21K *21/06*
U.S. Cl. 29—1.2 **8 Claims**

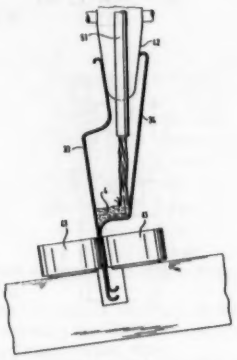


1. The method of making a long rod penetrator having an axis and a rearward portion which comprise stamping from sheet metal a plurality of fin sections having base portions configured for superficial engagement with said rearward portion and vane portions extending therefrom in orthogonal planes, and laser welding said fin sections to said rearward portion so that said vanes lie in common planes passing through said axis.

4,536,929
DEVICE FOR MANUFACTURING A SHUTTER LINK FOR A MULTI-LINK OVERHEAD SHUTTER OR ROLLER BLIND

Gustav Riexinger sen., Brackenheim-Hausen, and Rudolf Nagel, Schöneich, both of Fed. Rep. of Germany, assignors to Tuerenwerke Riexinger GmbH & Co. KG, Fed. Rep. of Germany

Division of Ser. No. 308,552, Oct. 2, 1981, Pat. No. 4,470,444.
This application Aug. 11, 1983, Ser. No. 522,454
Claims priority, application PCT Int'l Appl., Jul. 30, 1980, PCT/EP80/00066
Int. Cl.³ B21B *15/00*; B21D *39/03*; B23P *23/04, 25/00*
U.S. Cl. 29—33 K **13 Claims**



1. A device for manufacturing, in a continuous manner, shutter links for a multilink overhead-shutter or roller blind, said shutter links each comprising a pair of leaves which are bent into mutual engagement along their opposite longitudinal edges and which are shaped to form a cavity between said edges, said cavity being filled with a heat insulating compound, said device comprising a supply stand supporting two metallic strip coils, a first roll forming machine located along a path extending from said supply stand, said roll forming machine being provided with drive and shaping rolls to drive metallic strips from said strip coils and to shape the strips into the shape of the leaves of the shutter link elements and a second roll forming machine also located along said path beyond said first roll forming machine, said second roll forming machine having first pressure rolls adapted to force the shaped strips together along one longitudinal edge thereof, a spreading element positioned to extend between and force apart the other longitudinal edges of said strips, a filling nozzle positioned downstream of said spreading element for injecting a heat insulating compound between said forced apart other edges and into the cavity between the leaves and closing rolls arranged downstream from said filling nozzle to force the shaped strips together along said other longitudinal edge.

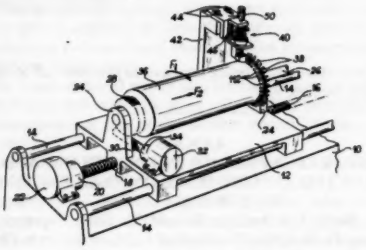
4,536,930
PROCESS AND MACHINE FOR INSERTING POINTS IN A MANDREL

Bruno P. Bompard, and Alain Bruyere, both of Lyons, France, assignors to Commissariat a l'Energie Atomique, Paris and Societe J. Brochier & Fils, Villeurbanne, both of, France

Division of Ser. No. 326,755, Dec. 2, 1981, Pat. No. 4,437,221.
This application Mar. 9, 1984, Ser. No. 587,977
Claims priority, application France, Jul. 16, 1981, 8113868
Int. Cl.³ B21B *15/00*; B21D *39/03*; B23P *23/04, 25/00*
U.S. Cl. 29—33 K **4 Claims**

1. A machine for inserting points in a supporting mandrel made from a material able to receive the points by direct insertion under pressure, in order to form axial rows of points

aligned in accordance with the generatrixes of the mandrel, and circumferential rows of points aligned in accordance with the circumference of the mandrel, said machine comprising means for supporting the mandrel in rotary manner, a working head carrying means for inserting the points in the mandrel, and displacement means for carrying out a given relative displacement parallel to the closest generatrix of the mandrel and a step by step relative displacement along the circumference of the mandrel between the working head and the mandrel,



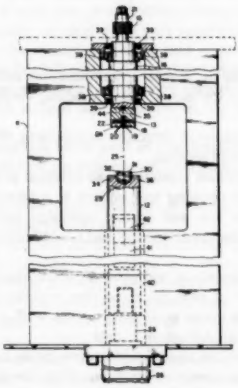
wherein the working head also carries a punch located ahead of the point to be inserted, in the displacement direction of the working head relative to the mandrel carried out by said displacement means, said punch being displaced by at least a distance equal to the spacing being defined by two successive points in at least one of said rows with respect to said point to be inserted, the means for inserting the points simultaneously acting on the punch to bring about a prior perforation of the mandrel.

4,536,931

BEARING BURNISHING METHOD AND APPARATUS

Ralph E. Roper, Indianapolis, Ind., assignor to Wallace Expanding Machines, Inc., Indianapolis, Ind.

Filed Mar. 26, 1982, Ser. No. 362,268
Int. Cl.³ B24B *39/00*
U.S. Cl. 29—90 R **8 Claims**



1. A burnishing apparatus for the burnishing of an annular thrust surface and wick slot oil ramps of a thrust bearing which has wick slots in the thrust surface, said apparatus comprising:

bearing holder means having means for immovably holding and orienting the thrust bearing, the thrust bearing having a first axis perpendicular to the annular thrust surface and positioned at the geometric center of the annular thrust surface;

a rotatable spindle which has a central axis and a tool assembly end and a gear assembly end;

first positioning means, on said bearing holder means, for positioning the thrust bearing so that the central axis is coaxial with the first axis;

a burnishing tool including an elongated bar which has a transverse convexly shaped burnishing surface and a tool mounting end, the tool mounting end being mounted to the tool assembly end of said spindle so that the burnishing surface rotates about the first axis;

second positioning means for positioning said burnishing tool with respect to said orienting means so that the burnishing surface and the wick slots of the thrust surface are in an initial alignment;

pressure means connected to said bearing holder means for maintaining the burnishing surface and the thrust surface in pressured contact;

rotating means for rotating said spindle, said rotating means including a rack and pinion, and the gear assembly end of said spindle being connected to the pinion said rotating means further including means connected to said rack for moving the rack and pinion to cause said spindle to rotate in a first direction about the first axis and then in a second opposite direction about the first axis;

first stopping means for stopping the rotation of said spindle at the end of movement in the first direction, said first stopping means being adjusted so that the burnishing surface and the wick slots of the thrust surface are in alignment at each such stopping; and

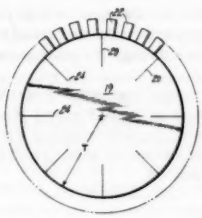
second stopping means for stopping the rotation of said spindle at the end of movement in the second direction, said second stopping means being adjusted so that the burnishing surface and the wick slots of the thrust surface are in alignment at each such stopping.

4,536,932

METHOD FOR ELIMINATING LOW CYCLE FATIGUE CRACKING IN INTEGRALLY BLADED DISKS

Roy L. Athey, North Palm Beach, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Nov. 22, 1982, Ser. No. 443,516
Int. Cl.³ B21K *3/04;* **B23P** *15/02*
U.S. Cl. 29—156.8 B **7 Claims**



1. In a method for forming an integrally bladed rotor disk from a plate-shaped forging preform having a rim, the steps of:

forming a plurality of circumferentially spaced-apart slots in said preform, said slots having a base, each slot extending radially from said rim to said base and extending axially through the full thickness of the preform; and

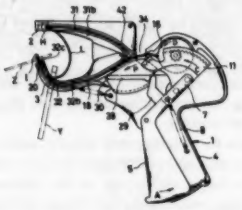
forming the rotor blades from the preform and forging the disk from the preform, including completely closing said slots from the slot base to the slot rim by forging to form forging laps along the radial extent of each slot without bonding together the surfaces of said slots, said forging laps being located circumferentially between adjacent blades.

4,536,933

DEVICE FOR CONNECTING ENDS OF FILAMENTARY FASTENER

Akira Furutsu, Tokyo, Japan, assignor to Japan Bano'k Co., Ltd., Tokyo, Japan

Filed Jan. 17, 1984, Ser. No. 571,538
Claims priority, application Japan, Jan. 31, 1983, 58-12996
Int. Cl.³ B23P *19/02*
U.S. Cl. 29—235 **5 Claims**



1. A device for connecting the pin end to the socket end of a filament fastener, comprising:

a main body;

a first arm provided on the front end of said main body, said first arm having a first guide groove therein;

a second arm rockably secured to said first arm and having a second guide groove therein;

a lever rotatably supported by said main body;

a pulley rotatably supported by said main body;

rotation transmission means for transmitting rotation of said lever to said pulley, whereby movement of said lever causes rotation of said pulley;

a flexible member haivng a first end connected to said pulley so as to be wound up on said pulley upon rotation therof, said flexible member being shaped so as to be guided by said first and second guide grooves when directed toward said first and second arms, respectively;

guide means for directing said flexible member into said first guide groove upon rotation of said pulley in one direction and for directing said flexible member into said second guide groove upon rotation of said pulley in the other direction;

clamping means, provided on the end of said flexible member opposite that end connected to said pulley, for clamping either the pin end or the socket end of a fastener and pushing such ends through the guide grooves of said arms; and

slider means operatively connected to said lever for moving said second arm close to said first arm, thereby causing the ends of a fastener, previously guided into position at the ends of said first and second arms by said flexible member, to become connected.

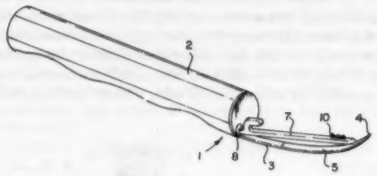
4,536,934

SHADE CLOTH PIN INSERTER

Francis P. Ward, P.O. Box 38632, Winnellie, Darwin, N.T., Australia (5789)

Filed Sep. 1, 1983, Ser. No. 528,734
Claims priority, application Australia, Apr. 22, 1983, 13907183
Int. Cl.³ B25B *27/14*
U.S. Cl. 29—278 **1 Claim**

1. A shade cloth pin inserter for passing a pin through the shade cloth to pin overlapping portions of shade cloth together, said inserter comprising a handle, a curved needle extending from the handle, a recess in the handle opening onto the needle where it extends from the handle, said needle being curved in side elevation so that a pin can be inserted into said recess adjacent said needle and extend as a chord across the curved needle to be slightly stressed and retained therein, said



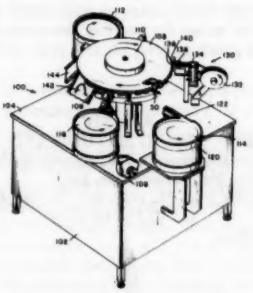
needle in cross-section being concave so that the end of the pin is located therein.

4,536,935

APPARATUS FOR MOVING, HANDLING AND MOUNTING ATTACHMENTS ONTO A LENGTH OF FLEXIBLE MATERIAL

Charles Wyle, Los Angeles; Donald M. Shea, Torrance, and Norman D. Best, Seal Beach, all of Calif., assignors to Charles Wyle Engineering Corporation, Torrance, Calif.

Filed Dec. 13, 1982, Ser. No. 449,143
Claims priority, application Sweden, Jun. 3, 1982, 8203424
Int. Cl.³ B25B *27/14*
U.S. Cl. 29—281.1 **40 Claims**



21. An apparatus to be used in conjunction with mass production machinery for moving and handling flexible material comprising:

a. a two part sandwich structure comprising an upper section and a lower section;

b. said upper section containing an internal groove beginning at a first opening and ending at a second opening, with both the first and second openings located on the front face of the upper section and spaced apart from each other;

c. the lower extremity of said groove protruding through the lower surface of said upper section such that the upper surface of said lower section forms the wall of the lowermost portion of said groove; and

d. the cross-sectional size of said groove being only slightly larger than the cross-sectional size of the flexible material to be placed into the groove;

e. whereby said flexible material can be pushed through said groove thereby permitting said flexible material to be also pushed through components to be attached onto the flexible material and also permitting said flexible material to be pushed through gripping members which can hold the flexible material and permit objects to be placed on the ends of the flexible material.

23. An apparatus to be used in conjunction with mass pro-

duction machinery for moving and handling flexible material comprising:

a. a stationary two part sandwich structure comprising a first section and a second section;

b. said first section containing an internal groove beginning at a first opening and ending at a second opening, with both the first and second openings located on the same face of the first section and spaced apart from each other;

c. one extremity of said internal groove protruding through the surface of said first section which is adjacent and comes in contact with a surface of said second section when the two sections of the two part sandwich structure are placed together to form the sandwich, such that the adjoining surface of said second section forms one wall of said internal groove;

d. the cross-sectional size of said internal groove in said two part sandwich structure being only slightly larger than the cross-sectional size of the flexible material to be moved and handled;

e. a multiplicity of gripping members located on the mass production machine, each of which contains a pair of moving jaws disposed adjacent opposite sides of each gripping member to form first and second moving jaws;

f. each moving jaw and the adjacent portion of a gripping member forming the opening of an internal groove which extends through the entire thickness of said gripping member to thereby form a first groove and a second groove in each gripping member;

g. the distance between the first and the second internal grooves in each gripping member being equal to the distance between said first opening and said second opening in said two part sandwich structure such that a respective groove in the gripping member and a respective opening of the groove in the two part sandwich structure are aligned when a gripping member is brought into alignment with the two part sandwich structure; and

h. each of said gripping members being movable on said mass production machine such that a respective one of said gripping members can be brought into alignment with said stationary sandwich structure at any given time;

i. whereby a flexible material feeding apparatus can be caused to push flexible material tubing through the first groove in said gripping member, into the first opening of said two part sandwich structure, through the internal groove in said two part sandwich structure, out the second opening in said two part sandwich structure and through the second groove in said gripping member, and to cut the flexible material just ahead of the first groove in the gripping member, to thereby permit the flexible material to be moved and handled in the mass production machine.

38. An apparatus to be used in conjunction with mass production machinery for moving and handling flexible material comprising:

a. a stationary two part sandwich structure comprising a first section and a second section;

b. said first section containing an internal groove beginning at a first opening and ending at a second opening, with both the first and second openings located on the same face of the first section and spaced apart from each other;

c. one extremity of said internal groove protruding through the surface of said first section which is adjacent and comes in contact with a surface of said second section when the two sections of the two part sandwich structure are placed together to form the sandwich, such that the adjoining surface of said second section forms one wall of said internal groove;

d. the cross-sectional size of said internal groove in said two part sandwich structure being only slightly larger than the cross-sectional size of the flexible material to be moved and handled;

e. a multiplicity of gripping members located on the mass production machine, each of which contains a pair of moving jaws disposed adjacent opposite sides of each gripping member to form first and second moving jaws;

f. each moving jaw and the adjacent portion of a gripping member forming the opening of an internal groove which extends through the entire thickness of said gripping member to thereby form a first groove and a second groove in each gripping member;

g. said pair of moving jaws on each gripping member forming a first moving jaw which serves to open and close the opening to the first groove in said gripping member and a second moving jaw which serves to open and close the opening to the second groove in said gripping member;

h. the distance between the first and the second internal grooves in each gripping member being equal to the distance between said first opening and said second opening in said two part sandwich structure such that a respective groove in the gripping member and a respective opening of the groove in the two part sandwich structure are aligned when a gripping member is brought into alignment with the two part sandwich structure;

i. each of said gripping members being movable on said mass production machine such that a respective one of said gripping members can be brought into alignment with said stationary sandwich structure at any given time;

j. a multiplicity of flexible material receiving members located on the mass production machine, each of which is in alignment with a respective one of said gripping members and spaced apart from the gripping member to permit the stationary sandwich structure come between a gripping member and a flexible material receiving means when they are brought into alignment with said two part sandwich structure;

k. mechanical actuating means to permit said first section to be separated from said second section;

l. a jaw opening means located on the mass production machine;

m. said jaw opening means containing three settings which can cause said first moving jaw and said second moving jaw to be set in one of three positions, closed, cracked-open and open; and

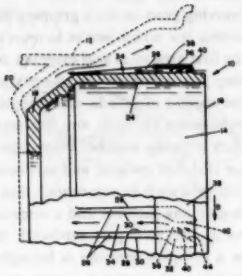
n. a flexible material sensing means which is in alignment with said internal groove in said two part sandwich structure and is adjacent said second opening in said two part sandwich structure;

o. whereby when said jaw opening means causes said first and second jaws to be in the cracked-open position, a flexible material feeding apparatus can be caused to push flexible material through the first groove in said gripping member, into the first opening of said two part sandwich structure, through the internal groove in said two part sandwich structure, out the second opening in said two part sandwich structure and through the second groove in said gripping member and when said flexible material sensing means detects said flexible material, said second movable jaw is caused to move to the closed position to grip the leading end of the flexible material while said first jaw remains in the cracked open position and said mechanical actuating means causes said first section of said two part sandwich to be separated from the second section of the two part sandwich to thereby permit additional lengths of flexible material to be fed and to slide between the separate sandwich sections and slide into the flexible material receiving means until a predetermined amount of flexible material has been fed.

4,536,936
METHOD OF FORMING A BRAKE DRUM

Richard J. Williams, Kenton, Ohio, assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Jan. 20, 1984, Ser. No. 572,273
Int. Cl.[3] B23D *11/02*; F16D *65/10*
U.S. Cl. 29—447 5 Claims



1. A method of forming a brake drum comprising the steps of:

casting an iron cylindrical braking drum with a flange end and an opened end to include a plurality of generally axially extending fins around an exterior surface thereof, said casting including providing each of said fins with radially extending side walls which diverge along a length thereof from said opened end to a widest distance therebetween at a predetermined location from said opened end and converge along said length thereof from said predetermined location to said flange end, whereby adjacent said side walls of adjacent said fins define a space therebetween having its narrowest portion at said predetermined location;

machining a braking surface about an interior of said cylindrical braking drum;

machining the top of said fins on either side of said predetermined locations to form a shoulder extending around the drum and spaced inwardly of the opened end;

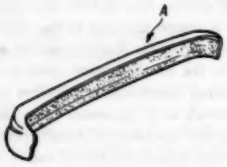
forming a steel band; and

securing said steel band to said braking drum at the machined top of said fins to encircle said braking drum and engage said shoulder to define, with adjacent sides of the fins, a plurality of venturi-shaped cooling channels at said predetermined locations.

4,536,937
PROCESS OF MANUFACTURING AUTO BUMPERS

Yasumasa Nagasaka, Okazaki, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Division of Ser. No. 93,974, Nov. 14, 1979, Pat. No. 4,339,144.
This application Jan. 15, 1982, Ser. No. 339,635
Claims priority, application Japan, Feb. 21, 1979, 54-19386
Int. Cl.[3] B23P *19/04*
U.S. Cl. 29—460 1 Claim



1. A process for forming an auto bumper comprising:

forming an outer visible part comprising a stainless steel plate having a first thickness;

forming a layer of one from the group consisting of aluminum and aluminum alloy bonded to one side surface of said plate, said layer being bonded to said plate by frictional deposition on substantially said entire one side surface, said layer having a second thickness smaller than said first thickness; and

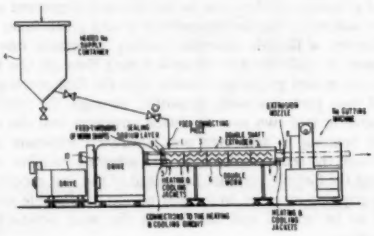
forming an inner part comprising a fiber reinforced plastic material bonded to said layer by heating and pressurizing said fiber reinforced plastic material to directly adhesively bond said layer to said fiber reinforced plastic material,

whereby said layer is sandwiched between and bonds said inner and outer parts to form a unitary bumper having low mass and high lustre.

4,536,938
PROCESS FOR THE CONTINUOUS PRODUCTION OF SOLID ALKALI METAL STRANDS

Walter Hinrichs, Brühl; Friedrich Hammer, Frechen-Habbelrath, and Ludwig Lange, Brühl, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 17, 1981, Ser. No. 255,512
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1980, 3016173
Int. Cl.[3] B22D *11/126*; B21C *23/00*
U.S. Cl. 29—527.5 6 Claims

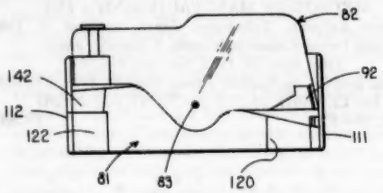


1. In a process for the production of solid alkali metal strands, the improvement which comprises providing molten alkali metal and introducing the molten alkali metal into a screw extrusion zone containing a double shaft extruder with side-by-side located horizontal worms, running in the same direction and being in mesh, establishing a temperature gradient in said extrusion zone, said gradient ranging from a relatively high temperature at or above the temperature at which the alkali metal is molten, to a relatively low temperature equal to a temperature below the molten point of the alkali metal, the relatively high temperature occurring at the point of introduction of the molten alkali metal to the extrusion zone, and the relatively low temperature occurring at the nozzle in the extrusion zone, moving the alkali metal in a continuous flow through the extrusion zone, cooling the molten alkali metal to a temperature below its melting point, at which temperature the metal is still sufficiently ductile for an extrusion, and feeding the metal to an extrusion nozzle for shaping, and thereafter shaping the metal by passing it through the extrusion nozzle having the required configuration for producing the strands.

4,536,939
TOOL FOR TERMINATING TELEPHONE CORDAGE WITH MODULAR PLUGS

Edwin C. Hardesty, Perry Hall, and Ronald C. Hardesty, Sykesville, both of Md., assignors to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Nov. 19, 1982, Ser. No. 442,929
Int. Cl.³ B25B 25/00
U.S. Cl. 29—566.4 4 Claims



1. A tool for terminating a flat cord, comprising a planar array of individually insulated conductors enclosed in a jacket having parallel sides and generally semi-circular ends, with a modular plug to connect electrically the conductors with terminals of the plug, said tool comprising:

a housing which includes a cord-receiving opening at one end and a plug-receiving nest at another end, said housing adapted to be supported and having a supporting surface at said one end to support an end portion of a cord stationary with respect to the housing, the cord-receiving opening of said housing having a width which is slightly greater than the least outer dimension of the cross-section of a cord which is to be inserted into the cord-receiving opening, and said housing including a plurality of ribs which extend into said plug-receiving nest to form a plurality of slots therebetween for receiving terminals which are partially seated in a plug when the plug is received in the nest to align and support the terminals; and

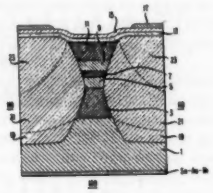
a rocker which is mounted pivotally centrally between the ends in said housing for movement between a first position where it is adapted to cut the cord jacket and a second position where it is adapted to cause the terminals to be inserted into the plug, said rocker having a first end which is adjacent to said cord-receiving opening and which includes cutting means having cutting edges that are spaced apart a fixed distance which is slightly greater than the outer diameter of each of the insulated conductors for cutting an end portion of a jacket of a cord that is inserted into said cord-receiving opening of said housing to facilitate stripping of the end portion, and a second end which is adjacent to said nest and which include terminal-inserting means for moving terminals that have been partially seated in a body of the plug into engagement with the conductors of the cord, and means for moving portions of the plug body into engagement with the cord jacket and the conductors to secure the plug to the cord, the cutting means in said first end of the rocker including a slot having a cord-entry portion and a jacket-stripping portion, the cord-entry portion being aligned with the cord-receiving opening of the housing when the rocker is in a first position, and the stripping portion of the slot of the rocker straddling a portion of the supporting surface as the rocker is moved into its second position, the supporting surface cooperating with the first end of the rocker during movement to cause the jacket-stripping portion of the slot to be moved into engagement with the jacket of the stationary, supported cord; and

wherein said terminal-inserting means of said rocker includes a plurality of spaced rams which are aligned with the partially seated terminals when the plug is inserted into the plug-receiving nest, the terminal-inserting means at the other end of the housing being in an inoperative position when the rocker is in the second position to allow a plug to be inserted into the cavity, and in an operated position when forces are applied to the second end of the rocker to move it into the first position, the central pivotal mounting of said rocker being effective to allow a plug having partially seated terminals to be inserted into said nest in the housing when the first end of the rocker is moved from the first position to cut the jacket of the cord which is stationary on the supporting surface, and to allow a cord end portion to be inserted into said cord-receiving opening when said rocker has been moved to the first position to cause said second end of said rocker to cause said rams to seat the terminals.

4,536,940
METHOD OF MAKING A LOSS STABILIZED BURIED HETEROSTRUCTURE LASER

Charles H. Henry, New Providence, and Ralph A. Logan, Morristown, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Division of Ser. No. 273,109, Jun. 12, 1981, Pat. No. 4,481,631.
This application Jun. 4, 1984, Ser. No. 617,265
Int. Cl.³ H01L 21/263, 33/00; H01S 3/19
U.S. Cl. 29—569 L 6 Claims

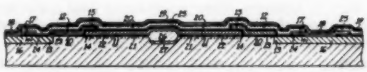


1. A method of fabricating at least one buried double heterostructure laser comprising the steps of sequentially growing first, second and third semiconductor layers on a semiconductor substrate, said second layer having a bandgap less than the bandgaps of said first and said third layers, said second layer being an active layer, etching a mesa having width fluctuations by removing portions of said first, second and third semiconductor layers thereby exposing said substrate and growing a fourth semiconductor layer, said fourth layer contacting opposite side faces of said first, second and third semiconductor layers.

4,536,941
METHOD OF MAKING HIGH DENSITY DYNAMIC MEMORY CELL

Chang-Kiang Kuo, 9639 Vista View Dr., Austin, Tex. 78750, and Shyh-Chang Tsaur, 12247 Monticeto, Stafford, Tex. 77477

Division of Ser. No. 133,376, Mar. 21, 1980, Pat. No. 4,376,983.
This application Feb. 28, 1983, Ser. No. 470,654
Int. Cl.³ H01L 21/70, 21/22; B01J 17/00
U.S. Cl. 29—571 15 Claims



1. A method of making a dynamic semiconductor memory cell of the one-transistor type comprising the steps of:

applying a first layer of conductive material on a face of a body of semiconductor material, said first layer being separated from a capacitor region of said face by thin insulator,

applying a second layer of conductive material onto said face partially overlying the first layer but separated therefrom by an insulator, the second layer being patterned to

define an elongated strip and a transistor gate, the gate overlying a channel region of said face but being separated therefrom by thin insulator,

forming a heavily-doped region in said face adjacent said channel region,

applying a third layer of conductive material onto said face overlying a part of said heavily-doped region, the third layer being wider than said heavily-doped region but being spaced from said first and second layers along the face, and

applying a layer of metal over said face contacting said third layer at a contact window over said part of said region.

4,536,942

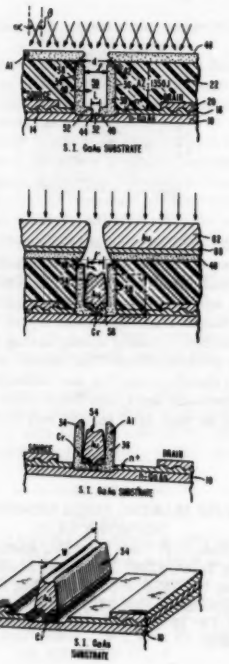
FABRICATION OF T-SHAPED METAL LINES FOR SEMICONDUCTOR DEVICES

Pane-Chane Chao, and Walter H. Ku, both of Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Division of Ser. No. 448,158, Dec. 9, 1982, abandoned. This application Oct. 5, 1984, Ser. No. 658,066

Int. Cl.³ H01L *21/285*

U.S. Cl. 29—571 **19 Claims**



1. A method of fabricating a low-resistance T-shaped gate electrode for a semiconductor device, comprising:

depositing a layer of resist material on a semiconductor surface;

defining a gate pattern in said resist material to produce a resist profile;

forming metal gate walls within and on the surface of said resist profile by angled evaporation to produce a metallized T-shaped gate cavity, said gate cavity having a bottom opening adjacent to and exposing said semiconductor surface, the dimension of said bottom opening being determined by the thickness of said layer of resist material and the angle of evaporation of said metal;

directly evaporating a gate material into said gate cavity, said gate material being deposited on the portion of said semiconductor surface exposed by the bottom opening of said gate cavity to form a Schottky junction at said semiconductor surface and being further deposited within said gate cavity to substantially fill said T-shaped gate cavity;

removing said layer of resist material; and

removing said gate walls.

4,536,943

METHOD OF MANUFACTURING A FET

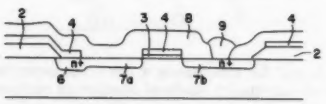
Masakazu Kakumu, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 20, 1983, Ser. No. 496,581

Claims priority, application Japan, May 21, 1982, 57-85937

Int. Cl.³ H01L *21/223, 21/225, 21/265, 21/283*

U.S. Cl. 29—571 **4 Claims**



1. A method of manufacturing an FET comprising:

forming an insulating film on the surface of a semiconductor substrate;

removing a portion of said insulating film from said substrate surface to form an exposed portion of said substrate;

forming a conductive film made up of a material selected from the group consisting of tungsten silicide (WSi_2), titanium silicide ($TiSi_2$), and platinum silicide (PtSi), on said insulating film and on said exposed portion, by simultaneously evaporating metal and silicon onto said exposed portion and insulating film;

introducing impurities into the surface of said substrate from outside the substrate through said conductive film so as to form an ohmic contact region at the contacting portion of said substrate and said conductive film; and

forming a source semiconductor region and a drain semiconductor region of said FET in said substrate by ion-implanting said substrate.

4,536,944

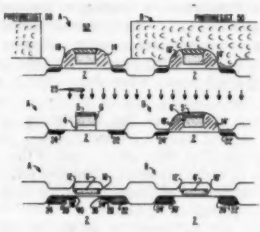
METHOD OF MAKING ROM/PLA SEMICONDUCTOR DEVICE BY LATE STAGE PERSONALIZATION

Al M. Bracco, Reston; Arthur R. Edenfeld, and Harish N. Kotecha, both of Manassas, all of Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1982, Ser. No. 454,315

Int. Cl.³ H01L *21/26, 21/265*

U.S. Cl. 29—571 **1 Claim**



1. A process for forming a FET memory on a semiconductor substrate of a first conductivity type, having a gate insulator layer deposited on the surface thereof with a polycrystalline silicon gate electrode formed on the surface of said insulator

layer, having a top surface and first and second opposed sidewall surfaces, comprising the steps of:

growing a silicon dioxide masking layer on said polycrystalline silicon gate electrode with a first portion thereof covering said first sidewall and having an exposed surface forming a first edge and a second portion thereof covering said second sidewall and having an exposed surface forming a second edge, to serve as an ion implantation blocking mask;

ion implanting a source and a drain region of a second conductivity type into said semiconductor substrate, said first portion of said masking layer blocking ion implantation into said substrate adjacent to said first sidewall and said second portion of said masking layer blocking ion implantation into said substrate adjacent to said second sidewall;

said source region having a first terminal edge aligned with said first edge of said silicon dioxide masking layer and separated by a first nonimplanted region in said substrate from alignment with said first sidewall of said gate electrode by the thickness of said first portion of said masking layer and said drain region having a first terminal edge aligned with said second edge of said silicon dioxide masking layer and separated by a second nonimplanted region in said substrate from alignment with said second side of said gate electrode by the thickness of said second portion of said masking layer, said first and second nonimplanted regions preventing FET action for the device, thereby representing a first stored binary state;

selectively removing said first and second portions of said silicon dioxide masking layer from said first and second sidewalls of said polycrystalline silicon gate electrode, exposing said first and second nonimplanted regions in said substrate;

ion implanting a source extension of said second conductivity type in said first nonimplanted region exposed by said selective removal step, extending said source region from said first terminal edge thereof to a second terminal edge aligned with said first sidewall of said gate electrode and ion implanting a drain extension of said second conductivity type in said second non-implanted region exposed by said selective removal step, extending said drain region from said first terminal edge thereof to a second terminal edge aligned with said second sidewall of said gate electrode, for selectively enabling FET action for the device, thereby selectively representing a second stored binary state;

whereby the FET memory device can have its binary state selectively programmed at a relatively late stage of its fabrication.

4,536,945

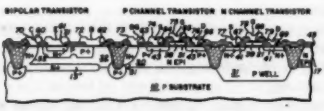
PROCESS FOR PRODUCING CMOS STRUCTURES WITH SCHOTTKY BIPOLAR TRANSISTORS

Bruce Gray, Danville; Kasivisvanatha Soundaranathan, San Jose, and Franklin D. VanGieson, Sunnyvale, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Continuation-in-part of Ser. No. 548,115, Nov. 2, 1983, abandoned. This application Apr. 17, 1984, Ser. No. 601,195

Int. Cl.³ H01L *21/22*

U.S. Cl. 29—571 **9 Claims**



1. In a process for forming isolated bipolar transistors, in combination with CMOS transistors, the steps comprising:

starting with a semiconductor wafer of a first conductivity type;

depositing a first impurity of an opposite conductivity type and heavy concentration in those regions where bipolar transistors are to be fabricated;

depositing a second impurity of said first conductivity type and heavy concentration in those regions where CMOS transistors having a channel conductivity of said opposite conductivity type are to be fabricated;

depositing a layer of epitaxial semiconductor material of said opposite conductivity type over said wafer and said first and second impurity regions;

depositing a third impurity of said first conductivity type on the surface of said epitaxial layer in those regions where said CMOS transistors having a channel conductivity of said opposite conductivity type are to be fabricated;

depositing an oxidation resistant coating over said epitaxial layer;

removing said oxidation resistant coating in the regions between said transistors wherein isolation is desired;

heating said wafer in an oxidizing atmosphere wherein said semiconductor is oxidized and continuing said heating until said epitaxial layer is approximately penetrated by the resulting oxide, said heating simultaneously acting to cause said second and third impurities to diffuse towards each other to contact each other and thereby from a well of said first conductivity type in said epitaxial layer;

forming a gate oxide;

depositing a polycrystalline semiconductor layer over said gate oxide and doping said layer to make it conductive;

removing said polycrystalline semiconductor layer except in those regions where CMOS transistor gates are desired;

masking said wafer with a resist having openings located in those regions where CMOS transistors having a channel conductivity of said opposite conductivity type are desired and depositing a fourth impurity of said opposite conductivity type at a heavy dose whereby the polycrystalline gates exposed in said openings are doped and act to self align the deposit to create transistor source and drain regions;

masking said wafer with a resist having openings located in those regions where bipolar transistor bases and CMOS transistors sources and drains having a channel conductivity of said first conductivity type are desired and ion implanting a fifth impurity of said first conductivity type at a low dose;

masking said wafer with a resist having openings located in those regions where bipolar transistor base contacts and CMOS transistors sources and drains having a channel conductivity of said first conductivity type are desired and ion implanting a sixth impurity of said first conductivity type to a level of doping substantially higher than that of said fifth impurity;

depositing a passivating oxide over said wafer thereby to cover said polycrystalline gates, said fourth and fifth impurity deposits, and said bipolar transistor regions;

masking said wafer with a resist having openings located in those regions where bipolar transistor collector contacts and CMOS transistor back gate contacts are desired, removing said passivating oxide exposed in said mask openings and diffusing a seventh impurity of said opposite conductivity type through the openings thus created in said passivating oxide to an extent where said seventh impurity contacts said first impurity;

masking said wafer with a resist having openings located where active device contact electrodes are desired for said CMOS and said bipolar transistors and etching holes in said passivating oxide;

masking said wafer with a resist having openings located in those regions where bipolar transistor emitters are desired and implanting into the thus exposed semiconductor an eighth impurity of said first conductivity type and a ninth impurity of said opposite conductivity type, said eighth impurity being deposited to a level selected to develop the

desired bipolar transistor base region and said ninth impurity being deposited to a level in said semiconductor to develop the desired bipolar transistor emitter;

heating said wafer to activate and diffuse said eighth and ninth impurities; and

applying metallization to said electrodes.

7. In a process for fabricating bipolar transistor emitter and base regions nested within a collector region in a monolithic integrated circuit semiconductor wafer, the improvement comprising the steps:

forming a passivating oxide, composed primarily of an oxide of said wafer material, on said wafer;

etching an opening in said oxide where said emitter is desired;

implanting base and emitter impurities into said wafer with said opening acting as an implant mask, wherein said base impurity species is selected to be lighter than said emitter impurity species; and

annealing said wafer to activate said impurities whereby said base impurities surround said emitter impurities.

4,536,946

METHOD FOR FABRICATING SEMICONDUCTOR PHOTODETECTOR

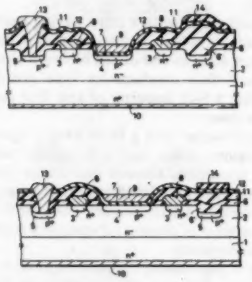
Junichi Nishizawa, No. 6-16, Komegafukuro 1-chome, Sendai-shi, Miyagi, Japan; Sobei Suzuki, and Takashige Tamamushi, both of Miyagi, Japan, assignors to Junichi Nishizawa, Japan

Filed Dec. 13, 1983, Ser. No. 561,103

Claims priority, application Japan, Dec. 13, 1982, 57-218591

Int. Cl.³ H01L *21/22*

U.S. Cl. 29—571 **10 Claims**



1. A process for producing a photodetector comprising a vertical static induction transistor, comprising the steps of: formaing a control gate region on a first principal surface of a silicon wafer; forming a shielding gate region on said first principal surface surrounding said control gate region; forming at least one first principal electrode region on said first principal surface in an area between said control region and said shielding gate region; forming a second principal electrode region on a second principal surface of said silicon wafer on the side opposite said first principal electrode region, said first electrode region and said shielding gate region being formed on said first principal surface in such a manner that a top of each of said regions is flush with said first principal surface; and forming an oxide film on the upper part of said shielding gate region by selective oxidation so that remaining portions of said shielding gate region are deeper in said silicon wafer than said first principal electrode region.

4,536,947

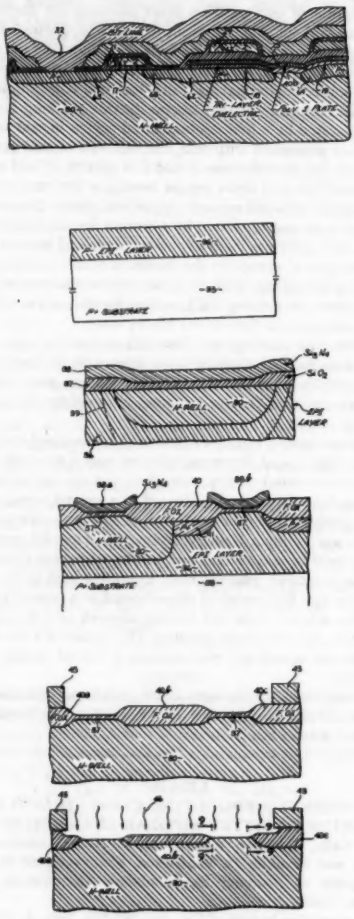
CMOS PROCESS FOR FABRICATING INTEGRATED CIRCUITS, PARTICULARLY DYNAMIC MEMORY CELLS WITH STORAGE CAPACITORS

Mark T. Bohr, Beaverton; Ken K. Yu, Portland; Leo D. Yau, Durham, and Shyam G. Garg, Beaverton, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 513,658, Jul. 14, 1983, Pat. No. 4,505,026. This application Jul. 2, 1984, Ser. No. 627,061

Int. Cl.³ H01L *21/306, 21/31*

U.S. Cl. 29—576 C **6 Claims**



1. A process for fabricating complementary metal-oxide-semiconductor dynamic memory comprising the steps of:

forming a well of a first conductivity type in an epitaxial layer;

forming an oxide layer of a first thickness on said epitaxial layer;

forming field oxide regions on said oxide layer to a second thickness;

defining first regions in said well for capacitors by performing a wet etch to remove said oxide layer in said first region and reduce said field oxide regions in said first region to a third thickness;

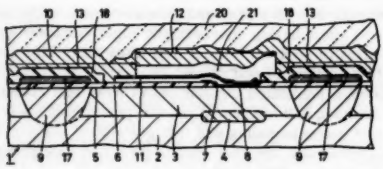
non-implanting said defined first regions with a dopant of a second conductivity type;
forming an insulative layer at least over said defined first regions;
forming a first polysilicon layer over said well, said first polysilicon layer being used to form a portion of said capacitor;
forming openings in said first polysilicon layer to define second regions for field effect transistors which are coupled to said capacitors;
forming word lines from a second layer of polysilicon;
whereby memory cells are fabricated in said well and the area for capacitor formation is increased.

4,536,948

METHOD OF MANUFACTURING PROGRAMMABLE SEMICONDUCTOR DEVICE

Ties S. Te Velde, and Arie Slob, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 258,112, Apr. 27, 1981, Pat. No. 4,460,914.
This application Apr. 23, 1984, Ser. No. 602,793
Claims priority, application Netherlands, May 8, 1981, 8002634
Int. Cl.³ H01L *21/90*
U.S. Cl. 29—577 C **6 Claims**



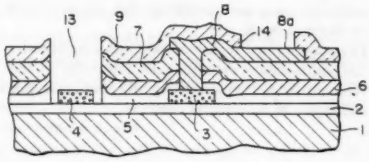
1. A method of manufacturing a programmable semiconductor device comprising a supporting member having at least a first line and at least a semiconductor circuit element connected to said first line by means of a blowable fuse, in which the blowable fuse is situated at least over a part of its length at a distance from the supporting member or the semiconductor circuit element, comprising the steps of:
starting with a supporting member having at a surface at least a first line and at least a semiconductor circuit element which comprises an electrode of nickel connected electrically conductively to a contact layer;
covering the assembly with a first auxiliary layer of aluminum;
providing in said first auxiliary layer a first window which exposes at least a part of the electrode and a second window which exposes at least a part of the first line;
providing a blowable fuse of nickel-chromium which connects the first line to the semiconductor circuit element on the first auxiliary layer and at least in the first and second windows;
covering the assembly with a second auxiliary layer of aluminum and forming apertures through the first and second auxiliary layers;
providing a patterned first layer of protective material, in which protective material remains at least at the area of the blowable fuse and in the apertures;
using said pattern as a mask, removing the two auxiliary layers selectively, in which the material of the first auxiliary layer is etchable selectively with respect to the materials of the supporting member, the first line, the electrode and the blowable fuse, the protective material and, at least insofar as covered by the first auxiliary layer, the material of the semiconductor circuit element, and in which the material of the second auxiliary layer can be etched selectively with respect to the protective material and the materials of the blowable fuse, as a result of which treatment protective material remains both in the apertures and at the area of the blowable fuse at a distance from the fuse;
providing at least the part of the surface which is not protected by the pattern from the first layer of protective material with a second layer of protective material so that a hollow space remains in which the blowable fuse is present while walls of the hollow space comprise protecting material of the first and second layers of protective material.

4,536,949

METHOD FOR FABRICATING AN INTEGRATED CIRCUIT WITH MULTI-LAYER WIRING HAVING OPENING FOR FUSE

Yoshihisa Takayama, Kawasaki; Kunihiko Gotoh, Kunitachi; Akihiko Ito, Kawasaki; Takeshi Yamamura, Zama, and Kazuyoshi Fujita, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 11, 1984, Ser. No. 609,441
Claims priority, application Japan, May 16, 1983, 58-85302
Int. Cl.³ H01L *21/28*
U.S. Cl. 29—578 **12 Claims**



1. A method for fabricating an integrated circuit device with multi-layer wiring and having an opening for a fuse in said multi-layer wiring, comprising the steps of:
(a) forming a first wiring layer of said multi-layer wiring to include said fuse;
(b) forming a first insulating layer covering said first wiring layer and said fuse;
(c) forming a contact hole in said first insulating layer for connection to said first wiring layer and removing at least a part of the whole thickness of said first insulating layer at a portion thereof over said fuse for providing said opening;
(d) forming a second wiring layer over said first insulating layer and connecting said second wiring layer to said first wiring layer through said contact hole;
(e) forming a second insulating layer covering said second wiring layer; and
(f) removing a respective portion of said second insulating layer over said fuse for providing said opening.

4,536,950

METHOD FOR MAKING SEMICONDUCTOR DEVICE

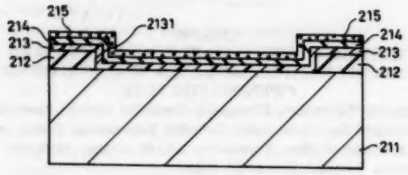
Hideaki Sadamatsu, Hirakata; Michihiro Inoue, Ikoma; Akihiro Kanda, and Akira Matsuzawa, both of Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Feb. 8, 1984, Ser. No. 578,036
Claims priority, application Japan, Feb. 10, 1983, 58-20660; Feb. 10, 1983, 58-20662; Feb. 10, 1983, 58-20663
Int. Cl.³ H01L *21/225, 21/265*
U.S. Cl. 29—578 **7 Claims**

1. A method of making semiconductor device comprising the successive steps of:
(1) forming an insulation film on a surface of semiconductor substrate of a first conductivity type;
(2) boring an opening in a selected portion of said insulation film thereby exposing said surface of said substrate;
(3) forming an antioxidation film directly on a selected region of said exposed surface of said substrate;

(4) forming first regions of a second conductivity by diffusion of an impurity through said opening into the portion of said substrate not covered by said antioxidation film;

(5) selectively forming an oxide film over the exposed surface of said substrate and the exposed surface of said first regions by thermal oxidation utilizing said antioxidation film as a mask;



(6) forming a second region of said second conductivity type communicating with said first regions by ion implantation through said antioxidation film on said semiconductor substrate using said insulation film and said oxide film as an integral mask; and

(7) forming a third region of said first conductivity type by ion implantation through said antioxidation film in said first and second regions using said insulation film and said oxide film as an integral mask.

4,536,951

METHOD OF PRODUCING A LAYERED STRUCTURE

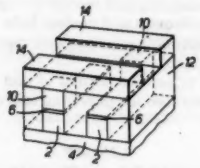
Stephen J. Rhodes, and Raymond E. Oakley, both of Northampton, England, assignors to Plessey Overseas Limited, Ilford, England

Filed Jun. 15, 1984, Ser. No. 621,187

Claims priority, application United Kingdom, Jun. 16, 1983, 8316476

Int. Cl.³ H01L *21/28, 21/88*

U.S. Cl. 29—589 **10 Claims**



1. A method of forming a layered structure, which method comprises depositing a first metal layer on a substrate, depositing a barrier layer on the first metal layer, depositing a second metal layer on the barrier layer, forming a first masking pattern on the second metal layer, etching the first and second metal layers and the barrier layer in accordance with the first masking pattern, removing the first masking pattern, forming a second masking pattern on the second metal layer, etching the second metal layer in accordance with the second masking pattern, removing the second masking pattern, depositing a dielectric layer having a thickness sufficient to cover the second metal layer, etching the dielectric layer to expose the second metal layer, and depositing on the etched dielectric layer and exposed second metal layer a further metal layer to contact the exposed second metal layer.

4,536,952

PREPARATION OF LAMINATED IRON CORE OF ELECTRIC DEVICE

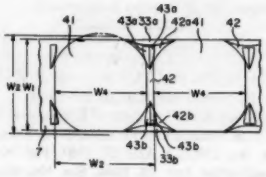
Yuko Shinryo, and Takashi Yamamoto, both of Nagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 338,994, Jan. 12, 1982, abandoned. This application Mar. 16, 1984, Ser. No. 589,405

Claims priority, application Japan, Jan. 12, 1981, 56-563472

Int. Cl.³ H02K *15/02*

U.S. Cl. 29—596 **2 Claims**



1. A method of preparation of a circular laminated iron core of an electric device, said method comprising the steps of:

stamping a strip having a width smaller than an outer diameter of said laminated iron core;

stamping iron core discs and excess from said strip, each of said discs having four straight edges, adjacent straight edges of adjacent ones of said discs being separated by first portions of said excess;

stamping segmented circular pieces from said excess, and stamping half segmented circular pieces from portions of said excess including said first portions of said excess;

processing said iron core discs to form iron core ring plates having four straight edges;

assembling said half segmented circular pieces to form additional segmented circular pieces; and

attaching said segmented circular pieces to said straight edges to form said circular laminated iron core plate.

4,536,953

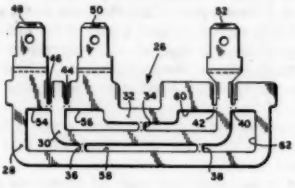
SWITCHING MECHANISM AND METHOD OF MAKING SAME

Dennis De Vera, Mundelein, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Oct. 31, 1983, Ser. No. 547,560

Int. Cl.³ H01H *11/00, 1/36*

U.S. Cl. 29—622 **5 Claims**



1. A method of manufacturing an electrical switch comprising:

(a) providing a base of electrically insulating material;

(b) positioning and retaining on said base a plate of electrically conducting material having a plurality of individual contact forming regions thereon interconnected by frangible portions;

(c) breaking away said frangible portions and forming on said strip a plurality of electrically isolated contacts; and,

(d) assembling on said base a wiper means moveable thereon

for making and breaking contact between a plurality of said contacts.

4,536,954

COIL INSERTER

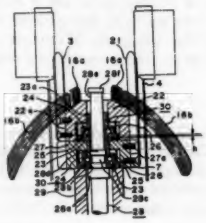
Takatoshi Hattori, Kasugai, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 23, 1983, Ser. No. 535,292

Claims priority, application Japan, Sep. 25, 1982, 57-167002; Nov. 15, 1982, 57-200142

Int. Cl.³ H02K *15/06*

U.S. Cl. 29—736 **3 Claims**



1. A coil inserter for inserting coils into the slots of a stator core, said coil inserter comprising:

(a) a pressing piece having a forward surface on which coils are disposed during use of the coil inserter, a rearward surface, and an axial through hole, said pressing piece being sized and shaped to slide axially into a stator core during use of the coil inserter;

(b) a blade supporter having a forward surface which faces the rearward surface of said pressing piece, a rearward surface, and an axial through hole which communicates with the axial through hole in said pressing piece, said blade supporter being sized and shaped to slide axially into a stator core during use of the coil inserter;

(c) a supporting member having a forward surface which faces the rearward surface of said blade supporter;

(d) a plurality of symmetrically arranged, axially extending first blades attached to the outer periphery of said pressing piece and extending forwardly therefrom;

(e) a plurality of symmetrically arranged, axially extending second blades attached to the outer periphery of said blade supporter and extending forwardly therefrom;

(f) said first and second blades having axial lengths such that, when the forward surface of said blade supporter abuts the rearward surface of said pressing piece, said first and second blades lie alongside each other forwardly of said pressing piece;

(g) said first and second blades alternating with one another around the periphery of said pressing piece and being spaced from one another to hold coils therebetween during use of the coil inserter;

(h) a first ball plunger fitted in the axial through hole in said pressing piece, said first ball plunger comprising an inner cylinder which is fastened to said pressing piece and which has a rearward surface which is co-planar with the rearward surface of said pressing piece, an outer cylinder which is axially movable relative to said inner cylinder and which has an inner, axially symmetric cam surface, a plurality of balls received in ball receiving holes in said inner cylinder in position to be cammed inwardly by rearward movement of the cam surface on said outer cylinder relative to said inner cylinder, and a spring which biases said outer cylinder rearwardly, said outer cylinder being axially movable between a first position in which its rearward surface is co-planar with the rearward surface of said pressing piece and abuts the forward surface of said blade supporter and a second position in which its rearward surface projects rearwardly from the rearward surface of said pressing piece by a stroke distance h, said inner and outer cylinders being interconnected to prevent said outer cylinder from projecting rearwardly from the rearward surface of said pressing piece by more than the stroke distance h;

(i) a second ball plunger fitted in the axial through hole in said blade supporter, said second ball plunger comprising an inner cylinder which is fastened to said blade supporter and which has a rearward surface which is co-planar with the rearward surface of said blade supporter, an outer cylinder which is axially movable relative to said inner cylinder and which has an inner, axially symmetric cam surface, a plurality of balls received in ball receiving holes in said inner cylinder in position to be cammed inwardly by rearward movement of the cam surface on said outer cylinder relative to said inner cylinder, and a spring which biases said outer cylinder rearwardly, said outer cylinder being axially movable between a first position in which its rearward surface is co-planar with the rearward surface of said blade supporter and abuts the forward surface of said supporting member and a second position in which its rearward surface projects rearwardly from the rearward surface of said pressing piece by the stroke distance h, said inner and outer cylinders being interconnected to prevent said outer cylinder from projecting rearwardly from the rearward surface of said blade supporter by more than the stroke distance h; and

(j) an operating rod which extends forwardly from said supporting member and is axially movable relative thereto, said operating rod extending through said inner cylinders of said first and second ball plungers and having a first enlarged collar at its forward end sized and positioned to abut against the balls in said first ball plunger when said balls have been cammed inwardly by rearward movement of said outer cylinder of said first ball plunger, a second enlarged collar spaced rearwardly from said first enlarged collar sized and positioned to abut against the balls in said second ball plunger when said balls have been cammed inwardly by rearward movement of said outer cylinder of said second ball receiving plunger, and a third enlarged collar spaced rearwardly from said second enlarged collar sized and positioned to abut against said inner cylinder of said second ball plunger to transmit forward motion of said operating rod to said blade supporter,

whereby, during use of the coil inserter,

(k) each coil is initially held by two pairs of blades, each pair of blades consisting of one of said first blades and one of said second blades;

(l) said pressing piece and said blade supporter are then moved forwardly together by forward motion of said operating rod with the forward surface of said blade supporter in abutment with the rearward surface of said pressing piece to insert the coils into the slots of a stator core;

(m) said blade supporter is then moved rearwardly by rearward motion of said operating rod, disengaging said second blades from the coils while said pressing piece and said first blades remain in position;

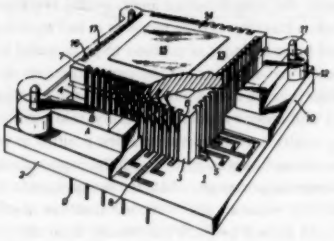
(n) said pressing piece is then moved rearwardly, disengaging said first blades from the coils; and

(o) steps (l), (m), and (n) are all accomplished by a single extension and retraction of said operating rod.

4,536,955
DEVICES FOR AND METHODS OF MOUNTING INTEGRATED CIRCUIT PACKAGES ON A PRINTED CIRCUIT BOARD

Bryan Gudgeon, Rossendale, England, assignor to International Computers Limited, London, England

Filed Sep. 20, 1982, Ser. No. 420,274
Claims priority, application United Kingdom, Oct. 2, 1981, 8129896
Int. Cl.³ H05K *3/34*; B23P *19/00*
U.S. Cl. 29—840 **4 Claims**



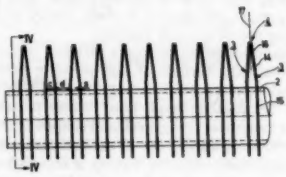
1. A method of mounting an integrated circuit package on a printed circuit board, the integrated circuit package having a plurality of conductive terminations for connection to conductors on the printed circuit board, by using a support member having a plurality of contact means arranged so as to be postionable one adjacent each conductive termination, with each of the contacts being so resiliently loaded that in a first relative positioning between the integrated circuit package conductive terminations and the contact means the contact means do not electrically connect with the conductive terminations, and a second relative positioning therebetween electrical contact is produced and maintained between the conductive terminations and the contact means, each said contact means being connected with a specified one of the conductors on the printed circuit board, the method of including the steps of providing means for exerting pressure upon the contact means to produce said electrical connection; electrically connecting each of the contact means to its specified conductor of the printed circuit board; actuating the means for exerting pressure to move the contact means against the resiliency thereof into electrical contact with the conductive terminations; and soldering each contact means to the associated conductive termination, the method being further such that the electrical contact producing pressure is maintained upon the contacts following the soldering operation, and that whenever it is required to unsolder the contacts the pressure is relieved prior to unsoldering so that following an unsoldering operation the resiliency of the contact means automatically causes each unsoldered contact means to spring away from the associated conductive termination as it is unsoldered.

4. A device for electrically interconnecting a plurality of conductive terminations on an integrated circuit package of corresponding terminations of conductors on a printed circuit board, the device including a support unit presenting a first surface or region for co-operating with the printed circuit board on mounting the support to the board, and a second surface or region for receiving the package, a first group of electrically conductive contact members having first portions mounted on the support and having second portions for connection with the terminations of the package on positioning the latter on the second surface or region of the support; a second group of electrically conductive second contact members electrically connected to the first group of contact members and having portions for connection with corresponding ones of the terminations of the conductors of the printed circuit board, each of said second portions of the first contact members being resiliently biased in a direction away from electrical contact with the associated terminations of the package, and a pressure producing means, movably mounted upon the support and arranged for co-operation with the second portions of the first contact members, the pressure producing means having a first position in which the second portions of the first contact members are resiliently loaded into electrical contact with associated ones of the package terminations to enable the physically co-operating second portions of the first group of contact members and package terminations to be soldered together, said loading being maintained on the first portions of the first group of contact members whilst the pressure producing means is in the first position thereby to stress relieve the soldered connections, the pressure producing means having a second position in which the loading on the second portions of the first group of contact members is released so that upon breaking any of the soldered connections, the unsoldered second portions of the first group of contact members automatically move out of electrical connection with the package terminations.

4,536,956
RECIPROCATINGLY DRIVABLE CUTTER FOR A DRY-SHAVING APPARATUS

Adam Koroncai; Alfred Nowak, and Herbert Piber, all of Klagenfurt, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 2, 1982, Ser. No. 414,159
Claims priority, application Austria, Feb. 12, 1982, 544/82
Int. Cl.³ B26B *19/02*
U.S. Cl. 30—43.92 **7 Claims**



1. A cutter reciprocatingly drivable in opposite directions and adapted to co-operate with the shear foil of a dry-shaving apparatus, which comprises support means; and a plurality of pairs of arcuate cutter lamellae mounted on said support means, the distance between the two cutter lamellae of each pair being smaller than the distance between either cutter lamella of such pair and the adjacent cutter lamella of the adjacent pair at the location of the top of the cutter lamellae; the two cutter lamellae of each pair respectively including angular portions oriented towards each other at the location of the top of the cutter lamellae, the angular portions of the two cutter lamellae of each pair being urged against each other under pre-load; and the cutter lamellae of each pair being elastically movable in both directions of reciprocation of the cutter, the leading cutter lamella of each pair, viewed in the direction of reciprocation of the cutter, acting as an elastic hair-pulling blade and the trailing cutter lamella of such pair acting as a rigid cutting blade.

4,536,957
SPLITTER FOR ELECTRICAL CABLE

Walter Britton, 4713 Acorn Dr., Lakeland, Fla. 33802

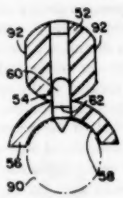
Division of Ser. No. 368,272, Apr. 14, 1982, Pat. No. 4,459,745, which is a continuation-in-part of Ser. No. 271,942, Jun. 9, 1981, abandoned. This application May 19, 1983, Ser. No. 495,997
Int. Cl.³ H02G *1/12*
U.S. Cl. 30—90.4 **1 Claim**

1. A method of splitting the outside sheath of an electrical cable comprising the steps of:

inserting a beading strip within a first trough of a first elongated member;

inserting the edge of the beading strip protruding from the first trough of the first elongated member within a longitudinal groove defined by a second elongated member such that the first and the second member are connected together by the interaction of the beading strip with the first trough and the longitudinal groove respectively;

adjusting the location of a cutting element within a transverse channel defined by the elongated members such that the cutting edge of the cutting element is disposed within a second trough of the second elongated member;



pressing the cable against the cutting edge of the cutting element such that the cutting edge pierces the outside sheath of the cable; and

pulling the cable longitudinally past the cutting means to split the sheath from the inner conductors.

4,536,958

TWIN ELEMENT, CYLINDRICALLY DISASSEMBLABLY HINGED TOOL

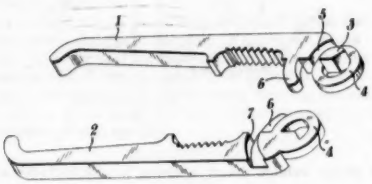
Riccardo Tosi, Valle Ceppi-Pino Torinese, Italy, assignor to Merisinter S.p.A., Arzano, Italy

Filed Nov. 22, 1982, Ser. No. 443,743

Claims priority, application Italy, Jun. 17, 1982, 48665 A/82

Int. Cl.[3] **A47J** *43/26;* **B26B** *17/00*

U.S. Cl. 30—120.3 **3 Claims**



1. A hinge arrangement, comprising two identical twin elements pivotable relative to one another about a pivot axis, each said element having a base portion with a circle sector surface with a center conciding with said pivot axis and formed with a predetermined width, an annular element defining a circular hole and having a width equal to half of said circle sector surface width, said annular element being connected to said circle sector surface so as to be concentric thereto, a cylinder sector shaped projection located in said circular hole so as to define an eyelet together with said annular element, said eyelet completing the cylindrical shape of said projection, said projection projecting from said annular element so as to form a circle sector groove together with said annular element and said circle sector surface, said groove being formed concentric to said projection and said annular element for slidably accepting said annular element of the other twin element, a circle sector tongue projecting from said base portion, and a seat for slidably accepting said tongue of the other twin element, said tongue and said seat being located adjacent to said circle sector groove and also concentric to said annular element, whereby said projection, said annular element and said tongue of each of the two twin elements may be coupled, respectively, with said eyelet, said groove and said seat of the other of the two twin elements to form the hinge, said projection of each twin element cooperating together to form a pivot which has an opening end-of-stroke position in which said tongues are disengaged from said seats said circle sector tongues and said seats cooperating so as to hinder an axial displacement of said twin elements, thereby permitting disengagement of said twin elements only when said tongues are pulled out of their respective seats in the opening end-of-stroke position.

4,536,959

FOLDING KNIFE

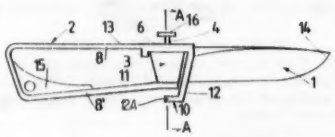
Mark A. Ross, P.O. Box 12, Greta Valley, North Canterbury, New Zealand, assignor to Mark Anthony Ross, N. Canterbury and Robert Allen Hiseman, Christchurch, both of, New Zealand

Filed Oct. 12, 1982, Ser. No. 433,782

Claims priority, application Netherlands, Oct. 12, 1981, 198614

Int. Cl.[3] **F41B** *13/08*

U.S. Cl. 30—161 **11 Claims**



1. A folding knife comprising:

a handle including upper and lower longitudinally extending arms interconnected at a rear end of said handle to form a generally U-shape as viewed in side elevation,

a blade including a cutting edge portion and a tang portion, said tang portion being disposed between said upper and lower arms and having top and bottom edges located adjacent said upper and lower arms respectively, pivot means pivotally connecting said blade to a forward end of said handle, said pivot means extending through said tang portion to define a pivot axis lying within the plane of said tang portion and about which said blade can be rotated by about 180 degrees between a forwardly projecting open position and a rearwardly projecting closed position,

one of said upper and lower edges of said tang portion including a portion of rectangular cross-section and the one of said arms situated adjacent said one edge including a recess of correspondingly rectangular cross-section,

said portion of the tang and said recess in the arm being mutually engageable when said blade is in said open and closed positions to unyieldingly resist lateral forces applied to said blade and which tend to rotate said blade about said pivot axis, and

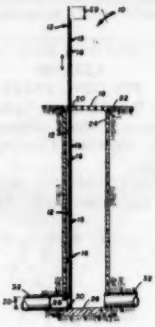
an additional arm connected to said one arm and projecting across and beyond the blade toward the other of said arms such that a distal portion of said additional arm is disposed beyond said other arm, thereby enabling said handle to be manually gripped by a user's hand with one finger on said distal portion,

said pivot means being manually displaceable along said pivot axis relative to said one arm by an engageable end of said pivot means projecting beyond said one arm and adapted to be engaged by another finger of the user's hand, said pivot means being connected to said tang portion such that when said engageable end is depressed by said other finger while said handle is held by the user's hand and while said one finger exerts pressure on said distal portion, said pivot means pushes said tang portion against said other arm to move said other arm away from said one arm to thereby mutually disengage said portion of rectangular cross-section to enable said blade to be rotated about said axis.

4,536,960
CALIPERS ARRANGED FOR REMOTE READING

Elliott J. Muti, 3423 E. Pratt St., Baltimore, Md. 21224

Filed Jul. 13, 1984, Ser. No. 631,828
Int. Cl.[3] G01B 5/02, 5/12
U.S. Cl. 33—143 M 22 Claims



1. A calipers device, said calipers device being arranged for remote reading of the measurement taken, comprising:

a first rod member;

a second rod member;

a plurality of coupler-guide members, said plurality of coupler-guide members being suitably affixed to said second rod member, each of said plurality of coupler-guide members being triangular in cross section configuration, said coupler-guide members each having a passageway therethrough, said first rod member being removably inserted through said passageways in said plurality of coupler-guide members and capable of slidingly moving in either direction through said passageways in said plurality of coupler-guide members when said second rod member is in a stationary position;

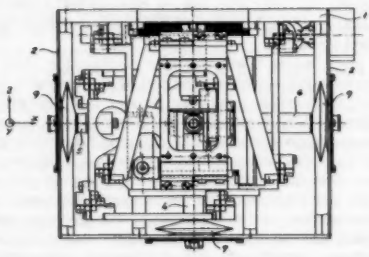
a first measuring point contact means, said first measuring point contact means being suitably affixed to said first rod member; and

a second measuring point contact means, said second measuring point contact means being suitably affixed to said second rod member.

4,536,961
THREE-DIMENSIONAL MEASURING DEVICE

Michel Degoumois, Le Locle, Switzerland, assignor to Meseltron S. A., Corcelles, Switzerland

Filed Mar. 28, 1984, Ser. No. 594,101
Claims priority, application Switzerland, Mar. 31, 1983, 1799/83
Int. Cl.[3] G01B 7/28
U.S. Cl. 33—169 R 28 Claims

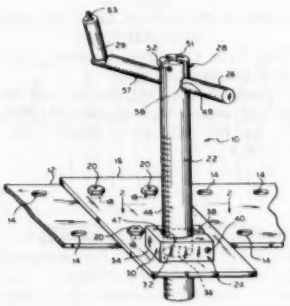


1. A three-dimensional measuring device containing at least one measuring sensor suspended by means of a suspension device, so as to be simultaneously displaceable in three orthogonal directions identified as x, y and z at right angles to a frame, that suspension device comprising, for each direction of displacement two moving bridges parallel to each other and joined by two rigid connecting elements hinged on the bridges so as to form a deformable frame, and a measuring detector to measure the relative displacement of the two bridges, characterized in that the suspension device comprises for the x direction a first upper bridge integral with the frame and a first lower bridge, for the y direction a second upper bridge rigidly connected to the first lower bridge and a second lower bridge, those second bridges located in the space separating the first upper and lower bridges, and for the z direction a first side bridge rigidly connected to the second lower bridge and a second side bridge to which said measuring sensor is fastened, said measuring sensor being moved to a reference position in the first two directions by gravity.

4,536,962
DATUM POINT LOCATION APPARATUS

Thomas R. Hense, New Berlin, and Ronald M. Rudolph, Oak Creek, both of Wis., assignors to Applied Power Inc., Milwaukee, Wis.

Filed Nov. 17, 1983, Ser. No. 552,768
Int. Cl.[3] G01B 5/03
U.S. Cl. 33—516 8 Claims



1. A motor vehicle datum locating fixture includes a base having means for securing the base to a support frame so that the base can be secured to a frame in any one of a plurality of discreet locations,

first, second and third elongate bar means which are circular in transverse cross-section,

first clamping means for fixing said first elongate bar means, in any of a plurality of axial and angular positions relative to the base,

second clamping means disposed on said first elongate bar means for fixing said second elongate bar means with its longitudinal axis extending perpendicular to the direction in which the axis of said first elongate bar means extends and in any one of a plurality of rotational angles,

said first and second clamping means including clamp means and means slidably and rotatably engaging said first and second bar means, respectively, to permit said first and second bar means to be slid axially and rotated in their respective first and second clamping means prior to the clamping thereof so that each may be positioned in a selected angular and longitudinal position relative to its respective clamping means, and

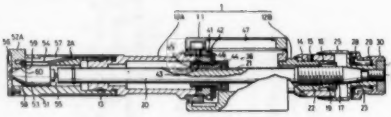
third means for mounting said third elongate bar means with its axis extending in a direction perpendicular to the direction in which the axis of the second bar means extends.

4,536,963

DIGITAL INDICATION TYPE MEASURING MACHINE

Takeshi Yamamoto, and Hideo Sakata, both of Kawasaki, Japan, assignors to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed Aug. 21, 1984, Ser. No. 643,225
Claims priority, application Japan, Aug. 29, 1983, 58-133266[U]; Aug. 29, 1983, 58-133267[U]
Int. Cl.³ G01B 5/12
U.S. Cl. 33—178 E 13 Claims



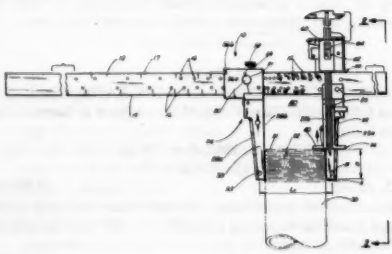
1. A digital indication type measuring machine comprising:
a main body having a spindle displaceable in the axial direction thereof;
a plurality of measuring heads detachably mounted to said main body, being different in size from one another, and each incorporating therein direction changing mechanism, in each of which a displacement value of said spindle is converted into a radial projection value of each of plural measuring elements at conversion rates equal to one another;
a displacement detector for detecting a displacement value of said spindle; and
an indication circuit processing an output signal from said displacement detector to obtain a measured length signal, digitally indicating a measured length value obtained from said measured length signal in an indicator and having a zero clear mechanism for forcedly clearing the indicated value in the indicator to zero value irrespective of the position of said spindle.

4,536,964

PIPE THREAD GAUGE

Richard J. Lazes, 2748 Orchid St., New Orleans, La. 70119

Continuation-in-part of Ser. No. 430,586, Sep. 30, 1982. This application Sep. 23, 1983, Ser. No. 535,216
Int. Cl.³ G01B 3/40
U.S. Cl. 33—199 R 12 Claims



1. A pipe thread gauge comprising:
a. an elongated rail;
b. first blade block assembly fixedly mounted on said rail and having a first thread-engaging blade fixedly connected thereto, said blade extending substantially normal to said rail;
c. second blade block assembly slidably mounted on said rail for longitudinal sliding movement therealong;
d. means for locking said second blade block assembly at selected locations along said rail;
e. second thread-engaging blade fixedly connected to said second blade block assembly and set at a selected angle to said first thread-engaging blade thereby defining an open throat capable of receiving the threaded end of said pipe; and
f. means slidable along said first blade block assembly for engaging said end of the threaded end portion of said pipe for visually indicating the length occupied by the threads on said threaded end portion of said pipe, wherein said visual indicating means provides a digital read-out of said length.

4,536,965

OPTICAL AIMING DEVICE

Bernhard Tildeblad, Grönsaksvägen 64, 611 45 Nyköping, Sweden

Filed Nov. 3, 1983, Ser. No. 548,322
Claims priority, application Sweden, Nov. 3, 1982, 8206249
Int. Cl.³ F41G 1/14
U.S. Cl. 33—233 7 Claims

1. Optical aiming device comprising a front sight and spaced therefrom a rear sight, said front sight comprising an upstanding needle-like element or an illuminated spot, characterized in that the rear sight comprises two prisms disposed symmetrically on either side of the plane of symmetry through the front and rear sights and disposed so as to produce one image each of the front sight, said image lying in level with the front sight.

4,536,966

REAR-SIGHT FOR A WEAPON

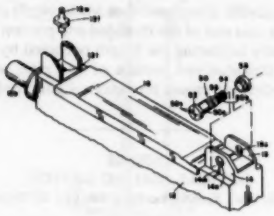
Isaac Engel, Tel-Aviv, Israel, assignor to The State of Israel, Ministry of Defence, Military Industries, Israel

Filed Jun. 28, 1984, Ser. No. 625,653
Claims priority, application Israel, Aug. 18, 1983, 69516
Int. Cl.³ F41G 1/28
U.S. Cl. 33—257 6 Claims

1. For use in a gun or the like having a front sight extending upwardly from a top side of the gun near the front thereof, a rear sight alignable with the front sight and supportable by first and second spaced apart ears extending upwardly from the gun near the rear end thereof, said rear sight comprising:
an elongated bolt-like element having a head and a substantially cylindrical body extending from said head, the ears of the gun having openings through which said substantially cylindrical body is insertable and alignable to be substantially parallel with the top side of the gun,
The length of said substantially cylindrical body from said head to an opposite end thereof being greater than the distance between the outer sides of the ears, whereby the

opposite end of said substantially cylindrical body extends through and out from a second one of the ears, and a portion of said substantially cylindrical body adjacent said head extends through and out from a first one of the ears when said cylindrical body is inserted into the openings of the ears.

said substantially cylindrical body having a first unthreaded portion extending a specific distance from said head and having a specific diameter, which is smaller than a diameter of said first one of the ears, whereby said substantially cylindrical body is insertable therethrough to extend to



said second one of the ears, and a second threaded cylindrical portion extending from said first cylindrical portion to the end of said cylindrical body, with the opening of the second one of the ears being threaded to receive said second cylindrical portion therethrough,

a radial recess formed in said first cylindrical portion at a predetermined distance from said head and having a predeterminded shape, and

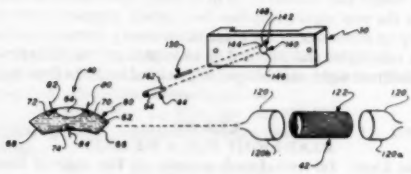
a locking nut adapted to threadably engage the part of said second cylindrical portion extending beyond the second ear.

4,536,967

TILT SENSOR AND METHOD OF ASSEMBLY

George W. Beitzer, Huntington, N.Y., assignor to Spectron Glass and Electronics, Incorporated, Uniondale, N.Y.

Filed Jan. 9, 1984, Ser. No. 569,399
Int. Cl.³ G01C *9/06, 9/28*
U.S. Cl. 33—366 **18 Claims**



1. A tilt sensor; comprising:

(a) mounting means;

(b) pedestal means secured to and extending from said mounting means;

(c) level sensor means secured to said pedestal means and having an exterior surface;

(d) thermal shunt means dispsosed about and in close proximity to said level sensor means and urged into close contact with said exterior surface of said level sensor means;

(e) said level sensor means containing a fluid electrolyte disposed therewithin to form a bubble of predetermined size and configuration and which is disposed at a predetermined location therewithin when the tilt sensor is in a predetermined position with respect to a given reference;

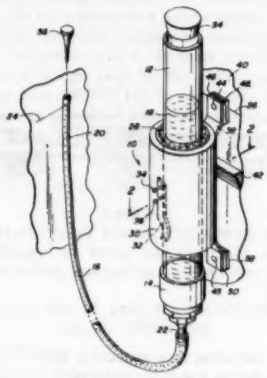
(f) said level sensor means further including conductive means suitably connected to said level sensor means for providing an output signal indicative of movement of said level sensor means with respect to said given reference.

4,536,968

ADJUSTABLE WATER LEVEL DEVICE

Jerome J. Lopiccolo, 90 Fischer Ave., Islip Terrace, N.Y. 11752

Filed Jun. 14, 1984, Ser. No. 620,693
Int. Cl.³ G01C *5/04*
U.S. Cl. 33—367 **4 Claims**



1. An adjustable water level device, comprising in combination:

(a) a transparent cylinder filled with a liquid whose upper surface is exposed to the atmosphere;

(b) an adapter fitting located at the bottom of said transparent cylinder wherein the downward force of water pressure may be transferred through a nipple located at the bottom end of said adapter fitting and thereon to liquid contained in a piece of tubing attached to said nipple whereby the level of water in said transparent cylinder is equal to the level of water in said piece of tubing as long as said tubing forms a "U" and as long as the level of the end of said tubing is such that water does not flow out of said tubing;

(c) means for attaching said adjustable water level device to a vertical surface such as a wall; and,

(d) means for adjusting said height of said water in said transparent cylinder, wherein said means for adjusting said height of said water in said transparent cylinder comprising an outer retaining cylinder encircling said transparent cylinder and permanently attached to said means for attaching and wherein the inner surface of said outer retaining cylinder is provided with an intermediate cylinder of resilient foam which acts as a friction clutch allowing the vertical movement of said transparent cylinder yet holding said transparent cylinder securely once set.

4,536,969

HOT WATER DRYING OF LOW RANK COAL

Michael I. Sherman, Glens Falls, N.Y., assignor to Kamyr, Inc., Glens Falls, N.Y.

Filed Sep. 30, 1983, Ser. No. 537,718
Int. Cl.³ F26B *3/00*
U.S. Cl. 34—9 **20 Claims**

1. A method of dehydrating low rank coal utilizing a heat exchange vessel having a top and a bottom, and comprising the steps of continuously:

(a) establishing a first flow stream of particulate low rank coal;

(b) preheating the first flow stream of particles;

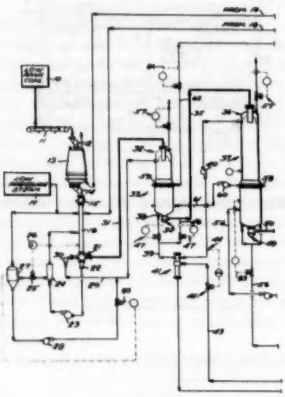
(c) immersing the first flow stream of particles in water;

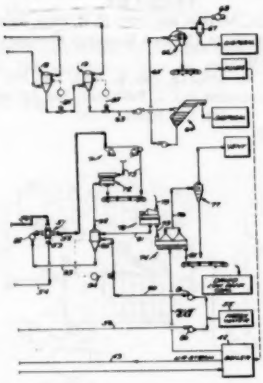
(d) transferring the particles flowing in the first stream immersed in water to a second flow stream having a pressure higher than in said first flow stream, but at a temperature less than the steam saturation temperature of the first stream;

(e) feeding the particles in the second flow stream to the top of the heat exchange vessel, and extracting liquid from the particles at the top of the heat exchange vessel and recirculating the extracted liquid to the second flow stream;

(f) introducing hot water to the bottom of the heat exchange vessel, to flow downwardly therein, the water having a temperature sufficient to facilitate dehydration of the low rank coal particles;

(g) discharging low rank coal particles from the bottom of the heat exchange vessel;





(h) feeding the low rank coal particles discharged from the bottom of the heat exchange vessel, with hot water, to the top of a dehydration vessel;

(i) extracting liquid from the particles at the top of the dehydration vessel and recirculating the extracted liquid to the heat exchange vessel;

(j) effecting counter-current washing of the particles at the bottom of the dehydration vessel to cool and wash the particles at the bottom of the dehydration vessel;

(k) withdrawing spent hot wash water, and water of dehydration, from the dehydration vessel and directing the hot spent wash water, and water of dehydration, to the heat exchange vessel to flow countercurrently to the low rank coal therein to effect a substantial recovery of heat from dehydrated low rank coal; and

(l) depressurizing the particles of low rank coal as they are discharged from the bottom of the dehydration vessel, the particles being withdrawn in a third particle flow stream, by transferring the particles flowing in the third flow stream to a fourth, lower pressure flow stream.

4,536,970

PROCEDURE FOR BOOSTING THE VENTILATION IN THE HOOD OF A PAPER MACHINE

Pekka Eskelinen, Turku, Finland, assignor to Valmet Oy, Finland

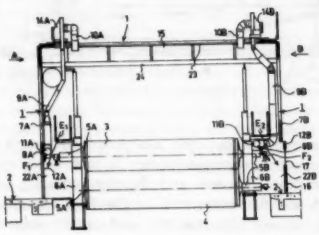
PCT No. PCT/FI83/00026, § 371 Date Nov. 14, 1983, § 102(e) Date Nov. 14, 1983, PCT Pub. No. WO83/03269, PCT Pub. Date Sep. 29, 1983

PCT Filed Mar. 16, 1983, Ser. No. 557,186

Claims priority, application Finland, Mar. 18, 1982, 820935

Int. Cl.³ F26B *3/24*

U.S. Cl. 34—41 **12 Claims**



1. In a drying section having a closed hood and side wall structures enclosing drying cylinders therewithin, a method for inhibiting condensation on the inner surfaces of the side wall structures, comprising the steps of:

disposing an air duct adjacent to at least one of the side wall structures of the closed drying section,

directing an air stream through the air duct, at least a portion of the air stream constituted by air from within the closed drying section, and

directing the air stream out from the air duct, substantially obliquely downwardly, and at least partially towards the inner surface of the respective adjacent side wall structure, to inhibit condensation on the inner surface wherein the humidity within the closed drying section is at least about 0.15 kg/kg.

4,536,971

APPARATUS FOR TESTING THE AIR-PERMEABILITY OF LENGTHS OF TEXTILES

Harald Pulsmeier, Hamischerstr., D-5163 Langerwehe-Heistern, and Walter Best, Merowingerstr. 8, D-5160 Dueren, both of Fed. Rep. of Germany

Filed Feb. 23, 1984, Ser. No. 582,719

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1983, 8305292[U]

Int. Cl.³ F26B *9/06*

U.S. Cl. 34—89 **40 Claims**

1. An air-permeability measuring apparatus for textiles, particularly for paper-machine felts and dryer fabrics, comprising:

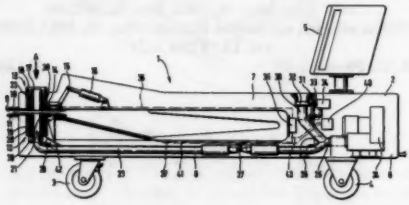
(a) a measuring fork having first and second rigid legs disposed in parallel overlying relation;

(b) a first double pipe stub displacably mounted to said first leg and said first double pipe stub comprising a first inner pipe stub providing a first inner flow channel and a first outer pipe stub radially spaced from said first inner pipe stub and therewith providing a first annular flow channel;

(c) a second double pipe stub mounted to said second leg and said second double pipe stub comprising a second inner pipe stub providing a second inner flow channel and a second outer pipe stub radially spaced from said second inner pipe stub and therewith providing a second annular flow channel;

(d) said double pipe stubs being coaxial and said first double pipe stub adapted for being displaced between a first insert position and a second clamping position wherein end faces of said double pipe stubs are oppositely disposed for clamping a length of fabric therebetween so that said second inner and annular flow channels commuicate with said first inner and annular flow channels;

(e) pipe means extending from each of said second inner and annular flow channels;



(f) exhauster means operably associated with each of said pipe means for exerting a vacuum on said second inner and annular flow channels and thereby inducing air flow through said first inner and annular flow channels when said first double pipe stub is in said second position;

(g) control valve means operably associated with the pipe means extending from said second annular flow channel for regulating the air flow therethrough;

(h) measuring means associated with the pipe means extending from said second inner flow channel for measuring the air flow therethrough; and,

(i) control means operably associated with said control valve means and with said exhauster means for assuring constant pressure on each of said second inner and annular flow channels.

4,536,972

SHELF LOWERING AND VIAL STOPPERING FREEZE-DRYING APPARATUS

Thomas E. Norton, Sr., 302 Valley Forge Rd., Cinnaminson, N.J.

Filed May 25, 1984, Ser. No. 614,346
Int. Cl.³ F26B *13/30*; B65B *7/28*
U.S. Cl. 34—92 **13 Claims**

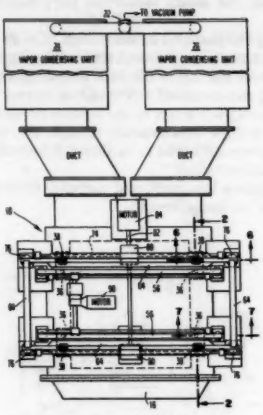
1. Freeze drying apparatus comprising

a chamber having a plurality of initially positioned, predeterminedly spaced, horizontally disposed, vertically aligned shelves supported therewithin,

means for simultaneously depressing a plurality of upper of said shelves to form a progressively increasing stack thereof atop an intermediately disposed support shelf,

means for controllably elevating each of said stacked shelves successively to said initially predeterminedly spaced disposition, and

additional means for elevating each shelf within said chamber disposed below uppermost of said shelves to decrease



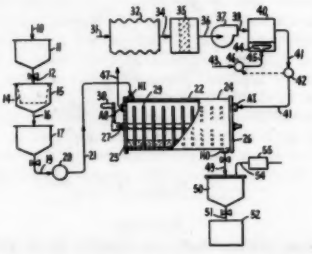
said predeterminedly spaced distance between adjacent shelves.

4,536,973

REMOVING WATER FROM HONEY AT AMBIENT PRESSURE

James L. Platt, Jr., Novato, and John R. B. Ellis, Kentfield, both of Calif., assignors to Chevron Research Company, Inc., San Francisco, Calif.

Division of Ser. No. 456,115, Jan. 6, 1983, Pat. No. 4,472,450.
This application Jul. 3, 1984, Ser. No. 627,648
Int. Cl.³ F26B *17/20*
U.S. Cl. 34—182 **5 Claims**



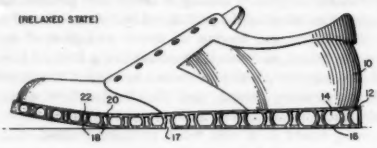
1. An apparatus for removing water from honey under evaporative cooling conditions comprising a housing for holding the honey, a horizontally positioned rotatable shaft within said housing having a high surface area rotatable body mounted thereon, means for adding honey to and removing honey from said housing, means for adding 40°to 75° C. substantially dry air to and removing moist air from said housing at a temperature effective to avoid decomposition of the honey, and means for rotating said shaft and said high surface area body.

4,536,974

SHOE WITH DEFLECTIVE AND COMPRESSIONABLE MID-SOLE

Eli Cohen, 350 Continental Ave., Paramus, N.J. 07652

Filed Nov. 4, 1983, Ser. No. 548,614
Int. Cl.[3] A43B 13/18, 7/08
U.S. Cl. 36—28 9 Claims



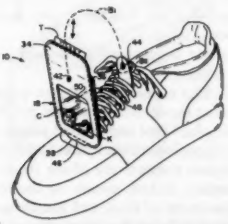
1. A sole component for a shoe comprising:
an inner sole provided directly underneath the shoe;
a mid-sole provided directly underneath said inner sole, said mid-sole provided with a plurality of pairs of ribs transverse to the longitudinal axis of said shoe, each of said pairs of ribs provided with first and second ribs, said first rib of one of said pairs of ribs provided with at least one portion angled with respect to said inner sole, and said second rib of said one of said pairs of ribs provided with at least one portion angled with respect to said inner sole and angled oppositely from said angled portion of said first rib, each of said pairs of ribs initially spaced from adjacent pairs of ribs such that when a force is applied normal to said shoe, each of said ribs freely deflects until each of said first ribs of said pairs of ribs intrudes upon a second rib of an adjacent pair of said ribs, at which point said ribs begin to compress; and
an outer sole provided directly underneath said mid-sole.

4,536,975

MULTI-PURPOSE DETACHABLE POCKET SYSTEM

Bruce W. Harrell, 3402 Auchentoroly Ter., Baltimore, Md. 21217

Continuation-in-part of Ser. No. 504,888, Jun. 16, 1983, Pat. No. 4,507,882. This application Mar. 30, 1984, Ser. No. 595,415
Int. Cl.[3] A43B 23/24
U.S. Cl. 36—136 7 Claims



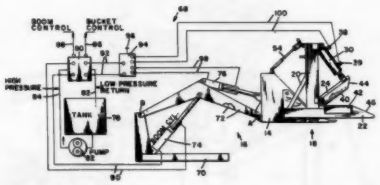
1. In a detachable pocket system for support by apparel such as laces of shoes or belts and having: a pocket with a bottom, open top, front face and back face and fold over cover for extending over the open top, a strap extending from the bottom of the pocket and having means for detachably securing around objects such as shoelaces or belts, the improvement comprising: the fold over cover being an extension of said front face and said extension over the open top being extend rearwardly and downwardly, said strap being an extension of one or the other of said front and back faces and extending rearwardly, then upwardly and then forwardly over said extension of the front face and downwardly to a free end, and said means for detachably securing including first means for attaching the free end to the front face.

4,536,976

BRANCH CUTTER MOUNTED ON FRONT LOADER BUCKET

Weikko R. Holopainen, Clover Ridge Farm Barre Rd., Hubbardston, Mass. 01452

Filed Jul. 22, 1983, Ser. No. 516,108
Int. Cl.[3] E02F 3/76
U.S. Cl. 37—117.5 8 Claims



1. Branch cutter for a tractor having a material handling element which is movable independently of the tractor, said branch cutter comprising:
(a) a frame,
(b) a fixed blade fixed to the frame,
(c) a movable blade which is pivotally mounted on the frame for movement between an open position in which the movable blade is spaced from the fixed blade to a closed position in which the movable blade cooperated with the fixed blade for cutting a branch which is positioned between the blades,
(d) a fluid driven actuator which is operatively connected to the frame and the movable blade for moving the movable blade between said open position and closed position,
(e) a bracket which is adapted to be attached to the material handling element of the tractor,
(f) means for for pivotally connecting the frame of the branch cutter to the bracket so that the frame can swing from a first position in which the movable blade moves in a vertical plane which is parallel with the moving plane of the material handling element of the tractor to a second position in which the movable blade moves in a plane which is perpendicular to the moving plane of said material handling element, and
(g) an adjustable stabilizing rod which is operatively connected to the said material handling element and the frame of the branch cutter for locking the branch cutter in either of said first and second positions.

4,536,977

PORTABLE, HAND-HELD STEAMING OR PRESSING DEVICE

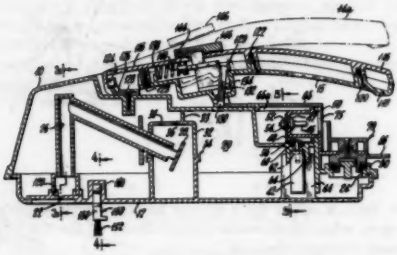
John S. Doyel, 404 W. 20th St., New York, N.Y. 10011

Filed Mar. 21, 1984, Ser. No. 591,971
Int. Cl.[3] D06F 75/16
U.S. Cl. 38—77.83 6 Claims

1. A portable, hand-held steaming/pressing device comprising:
a hollow, sealed housing having a front and a back end and a sole plate at its bottom, said plate having a steam outlet therein, and a filling hole positioned a selected distance above the sole plate to allow only a selected quantity of liquid electrolyte to be poured into the housing before overflowing when the sole plate is on a horizontal surface and a filling hole stopper manually movable between a locked position in which it engages and seals the filling hole, and a filling position, in which it can be moved away from the filling hole to allow pouring electrolyte onto the housing;
a pair of electrodes positioned inside the housing to be immersed in electrolyte when the housing is resting on the sole plate on a horizontal or nearly horizontal surface or

the front end of the housing points upwardly but not when up to said selected quantity of electrolyte is in the housing and the housing is upside down or on its side or its front end points downwardly, and a pair of electrical connector elements respectively connected electrically to the electrodes and extending outwardly of the sealed housing for connection with the plug of an electrical cord connectible to an electrical power outlet; and

safety interlock means for both (i) preventing the filling hole



stopper from being moved from its locked to its filling position while the cord plug makes electrical contact with said connector elements and (ii) preventing the plug from being moved into electrical contact with said connector elements while the stopper is in its filling position;

said electrodes, when immersed in electrolyte and connected electrically to a power outlet, passing electrical current through the electrolyte and thereby heating it to generate steam, and said steam exiting the housing through said seam outlet in the sole plate.

4,536,978

STEAM IRONING APPLIANCE

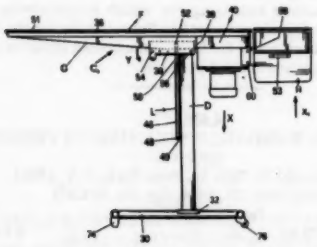
Rosanna Cerutti, Via degli Odescalchi 15, Milan (20148)

Filed Jan. 25, 1984, Ser. No. 573,681

Claims priority, application Italy, Feb. 7, 1983, 20706/83[U]

Int. Cl.³ D06F *81/08*

U.S. Cl. 38—103 **11 Claims**



1. A steam ironing machine comprising:

a support member;

an ironing board having first and second ends; a steam iron for cooperation with said ironing board to iron a cloth article and connected to a source of steam for applying steam to the cloth article;

suction means mounted on said first end of said ironing board for connection to means at said ironing board for removing residual moisture from the cloth article;

hinge means for pivotally mounting said ironing board, at a position thereof between said first and second ends thereof, to said support member for pivotal movement with respect thereto between a work position, whereat said ironing board extends horizontally, and a rest position, whereat said ironing board extends vertically with said second end thereof directed downwardly; and

shock absorber means for controlling movement of said ironing board in opposite directions between said work and rest positions and for absorbing stresses resulting from said movement, said shock absorber means comprising a pair of parallel shock absorbers, each said shock absorber including a cylinder having a lower end pivoted to said support member, and a piston rod movable into and out of said cylinder and having an upper end pivoted to said ironing board, said shock absorbers being located on a side of said support member directed toward said second end of said ironing board, said shock absorbers extending substantially parallel to said support member when said ironing board is in said work position thereof, and said shock absorbers being inclined to said support member when said ironing board is in said rest position thereof.

4,536,979

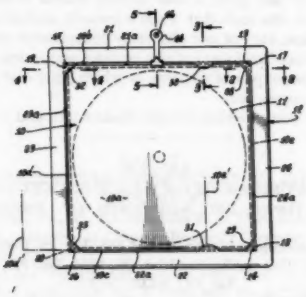
RECORD JACKET FRAME PERMITTING RECORD REMOVAL

Delbert J. Parkinson, Box 771, CECOM, FPO Seattle, Wash. 98773, assignor to Delbert J. Parkinson and William W. Haefliger, both of Pasadena, Calif., a part interest

Filed Oct. 26, 1981, Ser. No. 314,675

Int. Cl.³ G09F *1/10*

U.S. Cl. 40—159 **3 Claims**



1. For use in combination with a phonograph record jacket which is rectangular and has resiliently flexible corners, the combination comprising

(a) a rectangular frame having corners located to receive jacket corners,

(b) primary holder means on the frame to guide jacket longitudinal sliding movement generally parallel relative to the frame to displace first and second jacket corners into first and second positions of reception and retention in first and second corners respectively of the frame,

(c) and secondary holder means on the frame to interface with displacement of third and fourth jacket corners into and out of third and fourth positions of reception and retention in third and fourth corners respectively of the frame, and located to permit forcible flexible displacement of the third and fourth corners past said secondary holder means into and out of said third and fourth positions where the jacket first and second corners are in said first and second positions, whereby the jacket third and fourth corners may be displaced out of said third and fourth positions and the jacket slidably moved to displace the jacket first and second corners out of said first and second positions allowing edgewise insertion or removal of a record disc into or out of the jacket,

(d) said primary holder means including first and second tabs at said first and second frame corners to overlie the jacket first and second corners in said first and second positions thereof,

(e) said primary holder means also including auxiliary tabs on frame longitudinal lengths extending in the direction of said jacket sliding movement in spaced relation to the frame corners to overlie and guide longitudinal edge portions of the jacket,

(f) said primary holder means including third and fourth tabs at said frame third and fourth corners and having edges past which the jacket third and fourth coreners may be resiliently snap-deflected, into and out of said third and fourth positions,

(g) and including said record jacket having said first, second, third and fourth corners retained by the frame at said frame first, second, third and fourth corners, respectively, lengthwise edge extent of the jacket also being retained by said auxiliary tabs,

(h) said auxiliary tabs located closer to said first and second tabs, respectively, than to said third and fourth tabs, respectively, one auxiliary tab located between the first and third tabs, and the other auxiliary tab located between the second and fourth tabs,

(i) said frame having elongated ledges at the rear side thereof to register with jacket elongated edge portions when the jacket corners are displaced into said first through fourth positions, said first through fourth tabs being oversize relative to the jacket corners and extending diagonally relative thereto so that the jacket corners may be loosely received in said first through fourth positions, in directions parallel to the plane of the jacket,

(j) the frame including two longitudinally extending members interconnected by two laterally extending members, and including support means on one of the longitudinally extending members for hanging the frame on a carrier.

4,536,980

PIN SCREEN

Ward Fleming, 88 W. Broadway, New York, N.Y. 10007

Continuation-in-part of Ser. No. 423,114, Sep. 24, 1982, abandoned, which is a division of Ser. No. 91,125, Mar. 21, 1980, Pat. No. Des. 270,317. This application Aug. 30, 1983, Ser. No. 527,741

Int. Cl.³ A47F *11/06*

U.S. Cl. 40—427 **10 Claims**

1. A pin screen for producing visual display comprising:

a plate having a plurality of apertures extending through said plate,

supporting means supporting said plate in an elevated position relative to the ground,

at least some of said apertures in said plate receiving pins having (1) a shank insertable through said aperture and being selectively relatively movable with respect to said plate and (2) a pin head larger in width than the diameter of said aperture,

said pins inserted through said apertures being selectively movable relative to said plate through said respective apertures, said pins producing a visual display resultant only from the varying attitudes of said pin heads and oscillating and vibrating movements of the pin heads relative to said apertured plate.

4,536,981

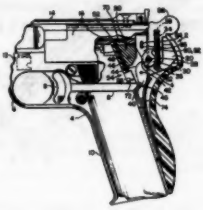
FIREARM ASSEMBLY

Paul S. Giragosian, 66 Lake St., Arlington, Mass. 02174

Continuation-in-part of Ser. No. 423,325, Sep. 24, 1982. This application Dec. 11, 1984, Ser. No. 680,353

Int. Cl.³ F41C *5/00, 19/00*

U.S. Cl. 42—69 B **2 Claims**



1. A firearm assembly comprising a frame assembly, a modular hammer and safety assembly, a slide receiver, and a barrel assembly,

said hammer and safety assembly comprising a housing,

slide means extending from said housing,

hammer means mounted in said housing,

disconnector means slidably mounted in said housing, and

safety means mounted in said housing,

said frame assembly having

slide means thereon adapted for alignment with said hammer and safety assembly slide means to cooperatively constitute an elongated uninterrupted slide means adapted to receive said slide receiver,

said slide receiver having

slide means thereon for slidable engagement with said combined frame assembly and hammer and safety assembly slide means, whereby to lock said hammer and safety assembly in said frame assembly,

safety actuator means thereon operable to engage said hammer and safety assembly safety means, and

cam means thereon for engagement with said hammer and safety assembly disconnector means,

said barrel assembly having means thereon for attachment to said frame assembly,

said frame assembly having means thereon for releasably retaining said barrel assembly.

4,536,982

CYLINDRICAL RIFLE HANDGUARD ASSEMBLY

Seth K. Bredbury, Winsted, and Harold J. Waterman, Jr., Wallingford, both of Conn., assignors to Colt Industries Operating Corp., West Hartford, Conn.

Filed Oct. 21, 1983, Ser. No. 544,009

Int. Cl.³ F41C *23/00*

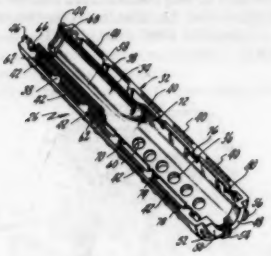
U.S. Cl. 42—71 R **12 Claims**

8. A section of a rifle barrel handguard assembly adapted to be formed by two substantially identical sections which section comprises:

a shell having a generally semi-cylindrical shape, the shell having a plurality of vent holes arranged in a longitudinal row in the center thereof extending substantially from the front to the rear of the shell, the shell being adapted to be placed around a barrel with the sides of the shell disposed laterally of the barrel, the front and rear of the shell having surfaces for mounting the shell upon the barrel and clamping the shell and an identical shell together; and

a liner, having a forward segment and a rear segment, of generally semi-cylindrical configuration, mounted in the shell, the forward segment of the liner having a plurality of vent holes which define a centrally disposed longitudinal row, the vent holes in the forward segment of the liner

registering with certain of the vent holes in the shell for cooling the barrel, the rear segment of the liner covering



the adjacent vent holes in the shell and having a flange which projects from a side thereof.

4,536,983

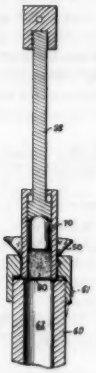
RELOADER FOR MUZZLE LOADERS

Daniel J. Fry, 731 Prospect Ave., Van Wert, Ohio 45891

Filed Aug. 12, 1983, Ser. No. 522,442

Int. Cl.³ F41C *27/00*

U.S. Cl. 42—90 **7 Claims**



1. A reloading device used to deposit a ball, a charge of powder, and at least a portion of a frangible membrane, into the bore of a muzzle loading firearm, wherein the reloading device comprises:

a plunger chamber, comprising an elongated hollow cylinder dimensioned to receive the ball and the charge of powder, and having a shallow reduced dimater portion on its exterior surface, and a projection extending outwardly from the shallow reduced diameter portion,

a plunger member slideably disposed in the plunger chamber, and

a locking collar having an internal recess dimensioned to receive the said projection on the plunger chamber, to join the locking collar and the plunger chamber together.

4,536,984

RETRIEVAL DEVICE FOR FISHING TACKLE

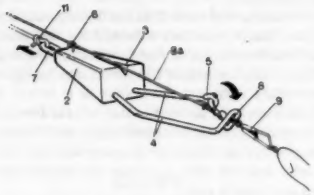
Leon Kowal, 15 Illingworth St., Canberra, Australia 2903

Filed Feb. 15, 1984, Ser. No. 580,422

Claims priority, application Australia, Feb. 18, 1983, PF8386; Feb. 23, 1983, 13537/83

Int. Cl.³ A01K *97/00*

U.S. Cl. 43—17.2 **2 Claims**



1. A fishing tackle retriever comprising

a weighted elongated body member having a forward portion and a rearward portion,

an attachment member at the rearward portion thereof for connection to a retriever line,

a pair of forwardly converging limbs extending from the said forward portion terminating in an upwardly directed closed loop to receive a snagged fishing line, said limbs including an openable metallic spring means forming a slot to admit said snagged line, said snagged fishing line being admittable to said closed loop by means of manually springing apart two contiguous unjoined portions of one of said limbs, said limbs being sufficiently spaced to permit the retriever to ride over a portion of the snagged fishing tackle whereby said loop can sit on a narrower portion of said tackle to engage the tackle on retrieval of said retriever line,

a rear guide member on the upper rearward portion of said weighted body member for admitting and being guided by the snagged line, and

a longitudinal groove in the weighted body, said rear guide member, and the upper portion of said closed loop, all being in longitudinal alignment for close guiding by the snagged fishing line.

4,536,985

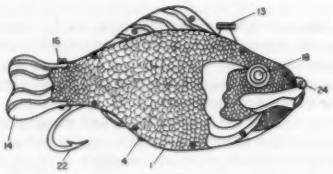
SELF-PROPELLED, PREPROGRAMMABLE FISHING LURE

Robert J. Caviness, 1601 18th St. NW. Apt. 210, Washington, D.C. 20009

Filed Aug. 19, 1983, Ser. No. 524,752

Int. Cl.³ A01K *85/01, 85/06*

U.S. Cl. 43—17.6 **11 Claims**



1. A self-propelled, preprogrammable fishing lure, comprising:

(a) a hollow body member;

(b) a propulsion means located in said body member;

(c) a direct current voltage source for powering said propulsion means; and

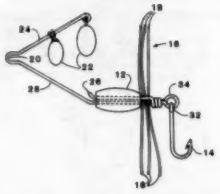
(d) electronic circuit means for causing said propulsion means to operate automatically in a variable, intermittent manner once said voltage source is actuated.

4,536,986

METHOD OF CONSTRUCTION OF SKIRT FOR FISHING LURES

Larry E. Stout, 9240 Carmel Rd., Atascadero, Calif. 93422

Filed Jan. 27, 1984, Ser. No. 574,396
Int. Cl.³ A01K *85/08*
U.S. Cl. 43—42.27 **9 Claims**



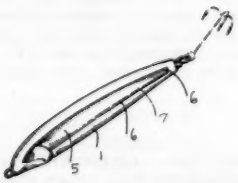
1. A method for securing skirt strands and a hook having an eye to a lure body, comprising the steps of:
(a) bending a length of wire back upon itself to define a shorter leg and a longer leg that extend from the bend;
(b) threading the eye of the hook onto the length of wire and positioning the eye at the bend;
(c) entwining the shorter leg and the longer leg to form a closed loop that passes through the eye of the hook;
(d) arranging the shorter and longer legs to extend side-by-side away from the closed loop;
(e) inserting skirt strands between the shorter and longer legs and generally perpendicular to them;
(f) inserting both the shorter and longer legs through the lure body;
(g) pressing the lure body toward the closed loop;
(h) bending the portion of the shorter leg that has passed through the lure body to lie at an angle with respect to the longer leg, to secure the skirt strands.

4,536,987

FISHING LURE

Clifford Sanders, and Joanne Sanders, both of Box 114, Whaletown, B.C., Canada V0P 1K0

Filed Sep. 28, 1983, Ser. No. 536,657
Claims priority, application Canada, Oct. 19, 1982, 413762
Int. Cl.³ A01K *85/00*
U.S. Cl. 43—42.34 **10 Claims**



1. In a jigging lure having a body simulating a fish, at a head portion thereof means for attachment to a fishing line and, at a tail portion thereof hook means for hooking the fish, the improvement comprising; an identical recess disposed symmetrically on each side of the body extending longitudinally of the body from behind the head portion to the tail portion, said recess having a flat planar base and surrounding side walls extending at an obtuse angle from the base and to the side surface of the body, whereby to provide the lure with an improved motion and acton as it is jerked or jigged through the water, making the lure more attractive to predatory fish.

4,536,988

AQUATIC BIOMASS CONTAINMENT BARRIER AND METHOD OF ASSEMBLING SAME

Delman R. Hogen, Minneapolis, Minn., assignor to The Lemna Corporation, Minneapolis, Minn.

Filed Jan. 31, 1984, Ser. No. 575,331
Int. Cl.³ A01G *7/00*
U.S. Cl. 47—1.5 **11 Claims**

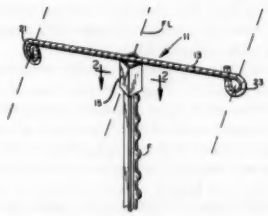
1. A floating containment barrier grid structure for containment of floating aquatic plants in a body of water, comprising:
a plurality of interconnected floating barrier sections, each barrier section having four sides arranged in a square configuration and enclosing the same amount of water surface area, the sides of said barrier sections having a top edge and a bottom edge, the sides lying in a vertical plane, said barrier sections having a specific gravity less than water, the top edge of said barrier sections extending above the surface of the water and the bottom edge of said barrier sections being off the bottom of the body of water, said barrier grid structure having sufficient elasticity to enable a portion of said barrier grid structure to be submerged below the surface of the water, the barrier grid structure being suitably anchored to prevent substantial lateral movement of said barrier sections across the surface of the water.

4,536,989

CROSS ARM UNIT

Clayton D. Caywood, Lodi, Calif., and Ronald L. Bogh, McMinnville, Oreg., assignors to Cascade Steel Rolling Mills, Inc., McMinnville, Oreg.

Filed Apr. 26, 1984, Ser. No. 604,238
Int. Cl.³ A01G *17/06*
U.S. Cl. 47—46 **2 Claims**

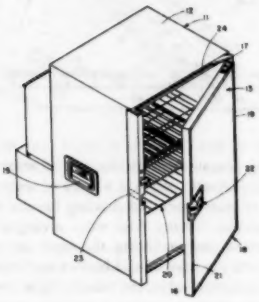


1. A trellis unit comprising a standard metal fence post of T shape in cross section having a head portion and a shank portion,
a cross arm unit of claim 9 for said post, with said socket member being slidably fitted over an end of said post,
The length of the shank portion of said metal post with the post considered in cross section being greater than one-half the diagonal of said passageway,
the end edge of said shank portion engaging a corner of said passageway,
the end edges of said head engaging inner faces which are remote from the mentioned corner.

4,536,990
TORSIONALLY STIFF LIGHTWEIGHT REFRIGERATOR/FREEZER DOOR

Gary D. Siegrist, and Edward S. Blain, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed May 17, 1982, Ser. No. 378,681
Int. Cl.³ E06B 3/00
U.S. Cl. 49—501 5 Claims



1. A torsionally stiff door structure mounted for pivotal movement at an upper and lower point on a line parallel to a hinge edge of said door, said door having a latch means at a point on an opposing latch edge of said door, said door structure, comprising in combination:

a pair of spaced apart panels forming respectively one side of said door and another side of said door,

said door experiencing a loading over the surface of said one side of said door, as well as, a highly directional opposing point loading on the other side of said door at a point near an upper portion of said door near said latch edge of said door, said surface loading and point loading tending to establish a bending moment about a first and second line, said first line passing through said upper point and intersecting a second line of said latch point, said second line additionally passing through said lower point,

at least two sets of intersecting U-shaped channel support members, each set having ends generally contiguous with said latch edge and said hinge edge,

said U-shaped channels having laterally extending flanges,

each support member of each of said sets of intersecting U-shaped channel support members having said extending flanges integrally secured over the length of said members to an adjacent surface of said spaced apart panels, each of said U-shaped channels having an outer surface integrally secured over the length of said channel to an adjacent surface of the other of said panels to thereby form a continuous box beam to transfer stresses to said space apart panels,

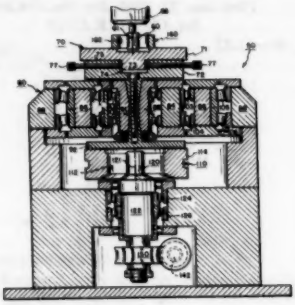
rigid support means between said panels along said hinge edge, said support means integrally secured to said panels and to said U-shaped channel support member ends contiguous with said hinge edge,

latch support means integrally mounted between said panels, said latch support means integrally secured to at least one of said U-shaped channel support members of each of said sets of intersecting U-shaped channel support members to thereby establish a door that is torsionally stiff when receiving said surface loading in one direction and said point loading in an opposing direction.

4,536,991
WORKTABLE WITH LATERAL AND ROTATIONAL MOVEMENT

Nils O. Hoglund, Jr., Berkeley Heights, N.J., assignor to Hoglund Tri-Ordinate Corporation, Berkeley Heights, N.J.

Filed Jul. 18, 1983, Ser. No. 514,505
Int. Cl.³ B24B 17/02
U.S. Cl. 51—101 R 4 Claims



1. A grinding apparatus for grinding a surface of a workpiece comprising:

a cam member having a surface corresponding to the surface to be ground on the workpiece.

a cam follower engaging the surface of the cam member,

means for supporting the workpiece and cam member for movement in accordance with the surface of said cam member, said means comprising:

a worktable to which said workpiece may be secured, said worktable comprising first and second members that fit together in sliding relation with a rectangular extension of one member protruding into a recess in the other member, said recess being large enough to permit in said recess linear movement of said extension in two dimensions and rotational movement about an axis perpendicular to said two dimensions, and at least eight adjustment screws with all of said screws mounted substantially in a single plane in said other member so at least two screws bear on each different side of said extension, whereby the lateral and rotational position of one of said members relative to the other may be varied by adjustment of the position of said adjusting screws,

a spindle connected to said cam member and said worktable, and

a spindle housing means in which said spindle is mounted for rotation about an axis of said spindle,

means for causing relative movement of the cam surface with respect to the cam follower, and

grinding means for engaging the surface of the workpiece to be ground as the cam surface moves relative to the cam follower.

4,536,992
PRECISION LAPPING SYSTEM

Douglas J. Hennenfent, New Hope; Allan L. Holmstrand, Bloomington, and Alan G. Kracke, Minnetonka, all of Minn., assignors to Magnetic Peripherals, Minneapolis, Minn.

Filed Nov. 4, 1983, Ser. No. 548,598
Int. Cl.³ B24B 7/00
U.S. Cl. 51—109 R 19 Claims

1. Apparatus for machining a workpiece surface, said surface having initial lateral stability, comprising:

a. a substantially rigid frame;

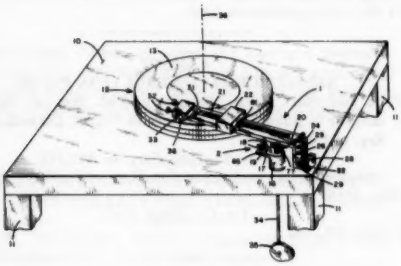
b. a lapping body having a substantially flat lapping surface carrying thereon abrasive particles within a predetermined area, and mounted on the frame for rotation about

a vertical axis with the lapping surface substantially horizontal;

c. a motor mounted on the frame and operatively connected to the body to provide torque for rotating the body;

d. a carrier arm support attached to the frame;

e. a rigid carrier arm assembly attached to the carrier arm support by a carrier arm pivot having a horizontal axis of rotation extending generally toward the predetermined area of the lapping body and lying within a predetermined distance of the plane of the lapping surface, said carrier arm assembly having a generally vertically extending segment journaled at the pivot, a segment extending generally horizontally toward the predetermined area of the lapping surface and along the carrier arm pivot's horizontal axis of rotation, and fixed to the upper end of the vertically extending segment, and a workpiece carrier attached to the horizontally extending segment at a point above and extending downwardly toward the lapping surface; and



f. means cooperating with the carrier arm support and the carrier arm pivot for allowing the workpiece carrier vertical movement above the lapping surface, wherein the workpiece carrier element includes a workpiece attachment means for fixing the workpiece with the surface to be machined facing downwardly toward and resting with gravity pressure on the lapping surface and within the circles traced by the inner and outer peripheries of the abrasive-carrying area.

4,536,993

GRINDING MACHINE

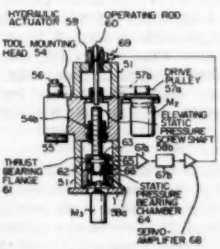
Masami Shimizu; Hisao Yoshikawa; Sosaku Kimura; Kazuo Shiba; Fumio Maeno; Shigehiro Fuwa, and Kuniyuki Mihara, all of Tokorozawa, Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed Mar. 9, 1983, Ser. No. 473,513

Claims priority, application Japan, May 12, 1982, 57-78311

Int. Cl.³ B24B *49/16*

U.S. Cl. 51—165.8 **2 Claims**



1. A grinding machine, comprising

a bed;

a pair of guide columns fixedly mounted on said bed, with a plurality of guide surfaces being formed on said guide columns in a common vertical plane;

a tool mounting head disposed between said guide columns, supported for vertical movement by supporting means comprising elevating means coupled to said tool mounting head and operable to adjust the vertical position of said tool mounting head, sensing and control means for detecting any vertically directed force applied to said elevation means by said tool mounting head, and an operating member coupled to support said tool mounting head and controlled by said sensing and control means for applying a vertically directed force to said tool mounting head having a direction and magnitude such as to compensate for said vertically directed force applied to said elevation means by said tool mounting head, said tool mounting head being further provided with hydrostatic bearing means for restraining said tool mounting head against movement other than in a direction parallel to said plane of said guide surfaces of the guide columns;

a tool shaft rotatably mounted in said tool mounting head;

drive means for rotating said tool shaft;

a grinding tool fixedly mounted on said tool shaft;

a workpiece slide mounted on said bed for sliding motion traversing a guide surface formed on said bed; and

means for mounting at least one workpiece holding jig upon said workpiece slide.

4,536,994

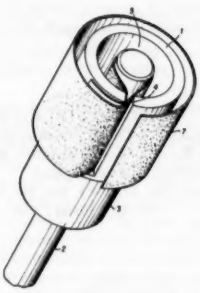
CURVED SURFACE SANDING DEVICE

William T. Krebs, 106 Virginia Ave., Cheraw, S.C. 29520

Filed Sep. 7, 1983, Ser. No. 530,062

Int. Cl.³ B24D *9/00*

U.S. Cl. 51—328 **2 Claims**



1. A method of sanding curved surfaces using a self-locking sanding device, said method comprising the steps of:

making a fold in a strip of abrasive paper;

inserting said fold around a mandrel and through a longitudinal slot of a tube coaxial to and surrounding said mandrel such that the abrasive paper strip on both sides of said fold extends through said slot to the outside of said tube;

wrapping said abrasive paper strip around said tube such that both sides of the fold extend at least partially around said tube;

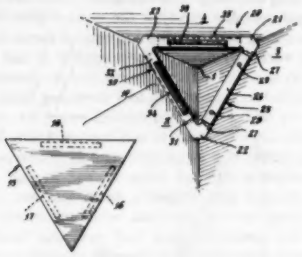
inserting an end of said mandrel into a drill chuck; and

operating said self-locking sanding device to sand an object, whereby said abrasive paper strip is positively locked in place by the forces acting thereon during said operation.

4,536,995
CORNER PANEL ASSEMBLY

Russell A. Frederick, 74 Walnut St., Milford, Conn. 06460

Filed Jun. 22, 1984, Ser. No. 623,354
Int. Cl.³ E04F *19/00*
U.S. Cl. 52—27 **12 Claims**



1. A corner panel assembly for mounting in a corner of a room, where two walls and the ceiling converge, the corner panel assembly comprising:

(A) a generally triangular mounting frame having three side pieces connected by corner brackets at their adjacent ends, the side pieces being V-shaped in crosssection and each having a panel leg deployed in one plane and a wall leg extending from the panel legs at an acute angle such that a wall leg lies substantially flat against the wall and ceiling surfaces, the wall legs adapted to receive fasteners for securing the wall legs to the adjacent wall and ceiling and thereby mounting the mounting frame in the corner;

(B) a generally triangular front panel sized to be received on and conceal the generally triangular mounting frame, with the marginal edges of the rear surface of the front panel being disposed against the panel legs of the side pieces; and

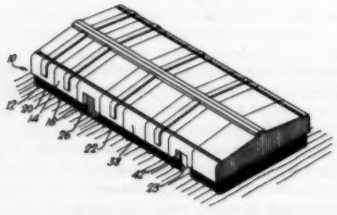
(C) securement means removably securing the front panel to the triangular mounting frame,

whereby the corner panel is adapted to mount items such as speakers, or security devices and the entire corner panel assembly mounts such devices in a corner of a room.

4,536,996
BUILDING STRUCTURE

Laurence M. Soden, 12 Corrib Heights, 30 Crescent Rd., London, N8, and John B. West, Pinehurst, Branksome Part Rd., Camberley, Surrey, both of England

Filed Feb. 17, 1983, Ser. No. 467,257
Int. Cl.³ E04B *1/346*
U.S. Cl. 52—67 **15 Claims**

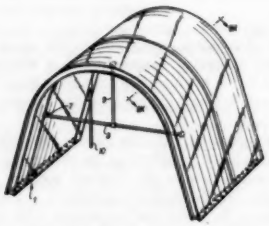


5. A permanent, non-transportable building structure which is constructed on site from component materials comprising an outer shell arranged to define a substantially enclosed usable space of adjustable dimensions, a section at least of the outer shell having a rigid lower frame including structural beams permanefitly mounted in foundations and defining a lower shell portion, a rigid upper frame defining an upper shell portion and including structural beams arranged slidably to engage the structural beam of the lower frame, wherein each of the structural beams is formed with a longitudinal side flange and the structural beams are arranged in slidably engaged pairs with the side flanges of the beams in each pair being arranged adjacent and generally parallel to one another for relative sliding movement and guide means are provided for fitting around the edges of adjacent side flanges of the beams in an associated pair for holding the beams in sliding engagement, the upper shell portion being slidable relative to the lower shell portion between a lowered position in which the two shell portions overlap to a substantial extent and a raised position in which the two shell portions overlap to a lesser extent, and means for fixing the upper shell portion relative to the lower shell portion in the raised position at least.

4,536,997
REINFORCED CONSTRUCTION PANEL

Felix Heescher, Horstel-Bevergern, Fed. Rep. of Germany, assignor to Rohm GmbH Chemische Fabrik, Darmstadt, Fed. Rep. of Germany

Filed Nov. 12, 1982, Ser. No. 441,173
Claims priority, application Fed. Rep. of Germany, Mar. 7, 1981, 3108711
Int. Cl.³ E04B *1/32*
U.S. Cl. 52—86 **9 Claims**



1. A structure comprising:

(a) a panel bent around a longitudinal flexure axis, said panel having a plurality of parallel, dovetail-shaped grooves in the inner surface thereof, each of said plurality of parallel, dovetail-shaped grooves lying in a plane which is perpendicular to said longitudinal flexure axis, and

(b) a plurality of tension elements each one of which is disposed in a plane which is perpendicular to said longitudinal flexure axis, each of said plurality of tension elements comprising two male fittings, one at either end, each of said male fittings being sized and shaped so as to be received and held in one of said plurality of parallel, dovetail-shaped grooves.

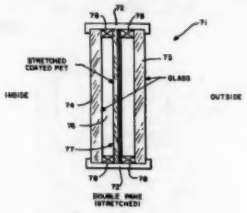
4,536,998
FLEXIBLE SELECTIVE ENERGY CONTROL SHEET AND ASSEMBLY USING THE SAME

John S. Matteucci, Healdsburg; James K. Snyder, and Robert E. Hahn, both of Santa Rosa, all of Calif., assignors to Optical Coating Laboratory, Inc., Santa Rosa, Calif.

Division of Ser. No. 308,025, Oct. 2, 1981, Pat. No. 4,463,047. This application Mar. 29, 1984, Ser. No. 594,927
Int. Cl.³ E06B *7/12*
U.S. Cl. 52—171 **11 Claims**

1. In an assembly of the character described, a frame, a pane of glass mounted in the frame and having inside and outside surfaces and an energy control sheet carried by the inside surface of the pane of glass, said energy control sheet comprising a sheet of substantially transparent flexible polymer thin film plastic material having first and second surfaces, an optically active substantially transparent adhesion promoting layer

adherent to said second surface of said sheet, said adhesion promoting layer being substantially continuous, a substantially transparent metal layer adherent to said adhesion promoting layer and a protective layer adherent to said metal layer, said



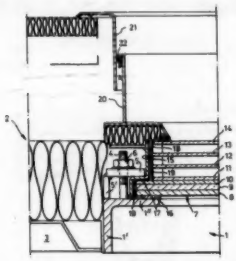
metal layer being formed of silver and having a thickness ranging from 60 to 200 Angstroms, said adhesion promoting layer and said protective layer being formed of zinc sulphide and having a thickness ranging from 300 to 500 Angstroms.

4,536,999

SHIP/OFFSHORE WINDOW FOR PERMANENT MOUNTING IN THE EXTERNAL STEEL BULKHEAD OF A WALL

Einar Eike, Tvedestrand, Norway, assignor to Golar Metall, Hilco Industries A/S, Tvedestrand, Norway

Filed May 25, 1983, Ser. No. 497,848
Claims priority, application Norway, Jun. 4, 1982, 821873
Int. Cl.³ B63B *19/00*; E06B *3/00*
U.S. Cl. 52—208 **2 Claims**



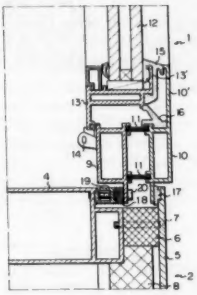
1. A ship/offshore window for permanent mounting in the external steel bulkhead of a wall, for example by welding, comprising a frame, preferably of steel, for pressure/proof and airtight retention of a number of glass members assembled in a package and having different desired properties for rendering the window pressureexplosion-proof and optionally, fireproof, light/heat reflective and soundproof, in different degrees and both separately and in various combinations, wherein the marginal edges of the pressure-proof glass member(s) project beyond the edges of the other glass members, said marginal edges being intended to be tightly but detachably retained between the window frame and releasable fastening means in engagement cooperating with the window frame, the improvement which comprises that the desired types of glass members are assembled in a hermetically sealed package unit of glass members, where said projecting margins of the pressure-proof glass members and the retracted margins of the other glass members are surrounded by a similarly offset (in cross section) protective/retainer frame, the projecting portion of said frame and the projecting margins of said pressure-proof glass member(s) being intended to be tightly but detachably retained between the inside surface of the window frame and said releasable fastening means which are secured to the window frame and are inwardly-projecting.

4,537,000

THERMAL INSULATING WINDOW FOR APPLICATION IN CURTAIN WALLS

Karl Gartner, Gundelfingen, Fed. Rep. of Germany, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Jul. 25, 1983, Ser. No. 517,007
Claims priority, application Japan, Jul. 26, 1982, 57-113264[U]
Int. Cl.³ E06B *1/32, 1/22*
U.S. Cl. 52—235 **2 Claims**



1. A thermal insulating window for application in curtain walls in which outer side skeleton members are connected to room side skeleton members of framed vertical members and horizontal members by means of thermal insulating members, said window comprising,

a thermal insulating window framework having internal framework members supported by the room side skeleton members of the curtain walls and external framework members connected to the internal framework members through thermal insulating members; and

a window body having a window casing mounted to the internal framework members of the thermal insulating window framework capable of opening and closing and a panel member supported at its periphery on the window casing;

said window being characterized in that it further includes a first sealing member consisting of a thermal insulating member which is adapted to cover the whole of the outer surface of the window casing and to be in contact with the outer upper portion of the external framework member whereby a thermal insulating area is provided at the junction of the window casing and the panel member and a thermal insulating space is defined between the thermal insulating window framework and the window body and

a second sealing member extends so as to be in contact at one end with the thermal insulating member which connects the internal framework members to the external framework members and at another end with the first sealing member and the window casing, thereby dividing the thermal insulating space between the thermal insulating window framework and the window body into two consecutive compartments disposed between outer and room side skeleton members.

4,537,001

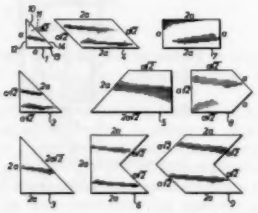
BUILDING ELEMENTS

Leif R. Uppström, P.O. Box 83, 154 00 Gnesta, Sweden

Filed May 23, 1983, Ser. No. 496,816
Int. Cl.³ B44F *7/00*
U.S. Cl. 52—311 **5 Claims**

1. Building elements of predetermined number with match-

ing side surfaces for fitting all of the predetermined number of building elements together to form construction of varying shape, each said building elements having the same length (L) and each having two opposite, equiform, flat, parallel end surfaces and at least three flat, rectangular side surfaces extending between said end surfaces thereby to present said matching side surfaces, the cross-sectional surfaces of the building elements each having a size which is a multiple of a triangular area of the size $a^2/2$, and the sides of the end surfaces having proportional lengths selected from the group consisting of a, $a\sqrt{2}$, 2a and $2a\sqrt{2}$ or a multiple thereof, "a" having a predetermined value, and the sides of the end surfaces defining proportional angles selected from the group consisting of 45°, 90°, 135° and 270°, said building elements to form said varying shape constructions being non-congruent, having non-congruent matching side surfaces and being always a nine in number said nine building elements being divided into three groups, a first group comprising a right-angled isosceles triangle, the equal sides of which each has a length a, a rectangle with sides



a and 2a and a parallelogram with sides $a\sqrt{2}$ and 2a, a second group comprising a right-angled isosceles triangle, the equal sides of which each has a length $a\sqrt{2}$, a parallel trapezium with sides $a\sqrt{2}$, 2a and $2a\sqrt{2}$, and a symmetrical pentagon defining with respect to its line of symmetry two parallel trapeziums having sides a, $a\sqrt{2}$, the third of said three groups of building elements comprising a right-angled isosceles triangle, the equal sides of which each has a length 2a, a symmetrical pentagon defining with respect to its line of symmetry two parallel trapeziums having sides $a\sqrt{2}$ and 2a, and a symmetrical hexagon defining with respect to its line of symmetry two parallelograms having sides $a\sqrt{2}$ and 2a, the end surfaces of the first group of building elements each having a height a, the end surfaces of the second group of building elements each having a height $a\sqrt{2}$ and the end surfaces of the third group of building elements each having a height 2a, all of said nine non-congruent building elements always being fitted together with predetermined of said side surfaces adjacent each other to form constructions of various shapes of varying cross-section but of the same area, $20a^2$.

4,537,002

GLAZING BEAD STRUCTURE

Robert T. Ellingson, Lakeville, Minn., assignor to Reese Enterprises, Inc., Rosemount, Minn.

Filed Sep. 8, 1983, Ser. No. 530,478

Int. Cl.³ E06B 7/16

U.S. Cl. 52—403 **4 Claims**

1. A glazing bead member secured within the socket of a window frame, comprising

a window frame having channels to receive a window pane,

a glazing bead having a body portion drawn through said channel to be partially disposed therein,

a flexible projection of said body portion for a weather seal engagement with an adjacent window pane,

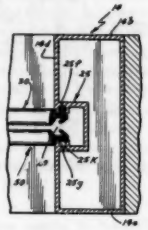
said channel having a restricted neck opening forming a shoulder at each side thereof at each side of said channel,

said body portion including an integral substantially rigid neck portion disposed into said restricted neck opening of said channel and extending thereinto,

said neck portion having a rigid stepped offset projection overlying a shoulder of said neck opening at one side of said channel,

said neck portion having a portion extending to the side of said channel opposite said one side of said channel,

said projection overlying said shoulder being pivotal thereon,



said bead upon being biased by a pane of glass being into said frame is caused to have said offset projection pivoted upon said shoulder restricted by said portion thereof engaging the opposed side of said channel securing said neck portion within said channel.

4,537,003

ELASTOMERIC SECTIONAL STRIP FOR EXPANSION JOINTS

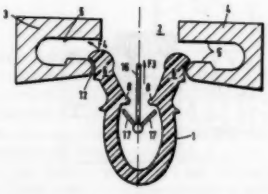
Reinhold Huber, Bulach, Switzerland, and Waldemar Koster, Forsbach, Fed. Rep. of Germany, assignors to Kober AG, Glarus, Switzerland

Filed Jul. 28, 1983, Ser. No. 518,238

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1982, 3228315

Int. Cl.³ E04B 1/68

U.S. Cl. 52—573 **4 Claims**



1. An elastomeric sectional strip for sealing an expansion joint on a building, each edge of which is thickened for engagement in one of a pair of grooves bordering the joint, characterized in that seen in cross-section, in the installed position, each thickened edge region is supported at three points with respect to walls of the groove, said three-point support being defined by:

(a) a bulge on an upper side of said edge region, said bulge being located inside said groove adjacent its opening;

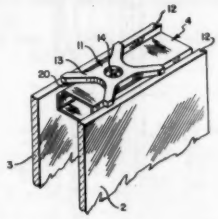
(b) a shoulder projecting in the form of a wedge into said groove in the opposite direction to the insertion direction on the underside of said edge region, said shoulder being supported against a corresponding stop face of said groove; and

(c) a camber on said upper side of said edge region on or close to its outer end, each of said grooves having a hollow cross-section complementary to the cross-sectional shape of said thickened edge region, excepting for the upper camber of the sectional strip, the height of each groove in the inlet region being less than the thickness of said section, measured through the lower shoulder.

4,537,004
INSULATED GLASS SPACER SUPPORT

Richard N. Anderson, Owensboro, Ky., assignor to Hunter Douglas Inc., Totowa, N.J.

Filed Jan. 24, 1983, Ser. No. 460,564
Int. Cl.³ E04C 2/34
U.S. Cl. 52—788 8 Claims

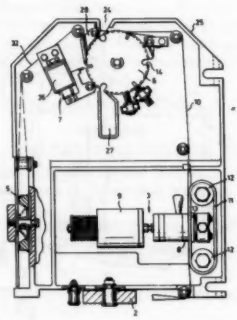


1. An insulated glass spacer support for use in an insulated glass structure having two parallel spaced glazings separated along adjacent edges by a spacer element, said support including a base adapted to overlie and contact a portion of the adjacent edges of said glazings and extending less than the length of the adjacent edges, and fastener means on said base adapted to fasten to and support a spacer element extending parallel to said adjacent edges and between said glazings.

4,537,005
BAG TYING MACHINE

Trevor B. Hoyland, Norwich, England, assignor to Thurne Engineering Co. Ltd., Norwich, England

Filed May 5, 1983, Ser. No. 491,735
Claims priority, application United Kingdom, Jul. 20, 1982, 8220925
Int. Cl.³ B65B 51/06, 51/08, 61/02
U.S. Cl. 53—131 9 Claims



1. A machine for applying adhesive tape ties to gathered together necks of filled bags comprising:

an adhesive tape supply means for supplying adhesive tape having an adhesive and a nonadhesive side;

manually moveable accommodation means including means for accommodating a gathered together neck of a bag and controlling translation movement of said neck through said machine;

an adhesive tape support means for supporting said adhesive tape and including an upstream end and a downstream end, said upstream end being remote from said accommodation means and forming a space therewith, said downstream end being adjacent to said accommodation means;

a slot in said support means adjacent said downstream end;

paper tape supply means for supplying paper tape through said slot;

a cutter;

adhesive tape from said adhesive tape supply means following a path between said manually moveable accommodation means and said adhesive tape support means with said adhesive side of said adhesive tape facing said adhesive tape support means, said adhesive tape being in substantially line contact only with said downstream end of said adhesive tape support means;

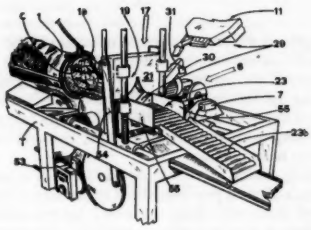
said paper tape being supplied through said slot into contact with said adhesive side of said adhesive tape;

movement of said neck and said accommodating means causing the adhesive tape downstream from said neck to bow away from said accommodation means into said space and in contact with said upstream end of said adhesive tape support means, continued movement of said neck and said accommodation means forming an adhesive tape loop around said neck of said bag and causing further adhesive tape to be drawn from said supply means and past said support means with line contact only being established between said further adhesive tape and said adhesive tape support means whereby said bag and said accommodation means will continue to move freely as said tie is formed and said paper tape is applied to said tie, said cutter severing both said paper and said adhesive tape upon completion of said tie.

4,537,006
AUTOMATIC APPARATUS FOR INDIVIDUALLY ENSHROUDING FRUIT AND VEGETABLE CONTAINERS IN A NET PROVIDED WITH A REINFORCING STRIP AND A LABEL

Vincenzo Pieri, Cesena, Italy, assignor to SORMA S.r.l., Italy

Filed Jan. 26, 1984, Ser. No. 573,968
Claims priority, application Italy, Mar. 25, 1983, 3378 A/83
Int. Cl.³ B65B 9/15, 51/05, 61/14
U.S. Cl. 53—134 10 Claims



1. Automatic apparatus for individually enshrouding fruit and vegetable containers in a net provided with a reinforcing strip and a label, comprising:

a station for infeeding the containers, sustained by a supporting frame and having, starting upstream and working downstream in the direction in which the containers move forward; a first conveyor for the containers; a second conveyor whose speed is greater than that of the first conveyor; a photocell, placed immediately downstream of the second conveyor, the obscuring of which, in the part of each container, interrupts the supply circuit of the drive motor of the said first and second conveyor; and a net carrying pipe, placed downstream of the said conveyors, the said net prior sealed at the front extremity in such a way as to constitute a sort of intestine made out of netting, mounted around the external surface of the said net carrying pipe, this having internally a channel through which the containers can pass and along which is able to traverse, guided, alternately in the two directions, a longitudinal element provided with a plurality of equidistant projecting parts, each of which furnished to define a

unidirectional locator member in the direction in which each container issues from the pipe, so as to cause each container to move one step at a time from the entry point to the exit point of the pipe and a pair of extension members to support the containers downstream of the exit point of the net pipe;

a station at which each container is enshrouded in a net, placed downstream of the net carrying pipe and completely supported by a carriage that is sustained by the frame in a way whereby it is able to slide, movable alternately in the two directions along the path followed by the containers as they move forward, the said carriage having fixed thereto a net sealing and cutting means and a guillotine device constituted by: a first pair of stationary locator elements of V conformation, placed transversely to the forward movement direction of the containers and spaced with corresponding parallelism in such a way as to accept there between, said sealing and cutting means for sealing and cutting the said front extremity of the net; and a second pair of movable locator elements of upside down V conformation that operate in contrast with the said first elements and are placed there above in planes slightly staggered with respect thereto, the said second elements being able to traverse vertically in the two directions, from a first raised position coinciding with the maximum upstream position of the said carriage towards the net carrying pipe, in which the two pairs of elements form a rhomboid aperture such as to allow the free passage of each net enshrouded container, the front extremity of the said longitudinal element and said pair of extension members destined to support the container prior to its transfer, to way past the guillotine device onto a transiting platform mounted on the carriage, to a second extreme lowered position in which the said carriage is placed sufficiently downstream for the said second movable elements not to come into contact with the said extension members, and in which the vertices of the said V's define a small aperture sufficient to firmly restrain, in the correct position, the front part of the netting immediately upstream of each container already positioned on the transiting platform;

a station for the fitting on of the container reinforcing strips, comprising a reel that is placed upstream of the said guillotine device and supplies a long strip kept at the side of the section of the net issuing from the net carrying pipe and having the extremity thereof initially fastened to the front part of the net, the said strip subsequently being fixed and cut along with the net every time the said sealing and cutting head operates;

a labelling station at which, downstream of a label supply group, a chute is provided fitted to the side of the said first pair of stationary locator elements, for transferring a pair of labels at a time, with one label hanging from one side thereof and with the other label hanging from the other side thereof, in the region of the vertex of the V of the said stationary locator elements, where the said sealing and cutting head operates, the action of this also determining one label being firmly fixed to each container;

and one single main motor, carried by the frame, for providing contemporaneously and on a time relationship basis, the said longitudinal element, the said second movable locator elements and the said carriage, with their motion.

4,537,007

PROCESS AND PLANT FOR ENDLESS-CYCLE STERILIZATION OF SHEET MATERIAL UTILIZED IN ASEPTIC PACKAGING OF PRE-STERILIZED FLUID PRODUCTS

Ettore Lattanzi, Via Caprera, 1, Parma, Italy (43100)

Filed Jan. 21, 1983, Ser. No. 459,968

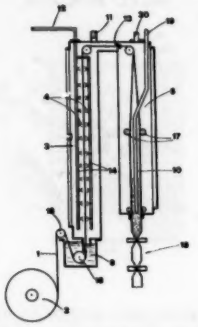
Claims priority, application Italy, Jan. 29, 1982, 40007 A/82

Int. Cl.³ B65B *55/02*

U.S. Cl. 53—425 **11 Claims**

1. A method for preparing sterilized packages containing pre-sterilized foodstuffs without the use of chemical sterilizers, comprising the steps:

bathing both sides of a continuous sheet of material in a non-sterilizing fluid;



applying superheated steam to both sides of the wetted sheet so that the wetted sheet is sterilized;

shaping the sheet into a tube;

filling the tube with pre-sterilized foodstuffs; and

forming the tube into individual packages.

4,537,008

METHOD AND APPARATUS FOR PACKING SOFT PACKAGES INTO BOXES

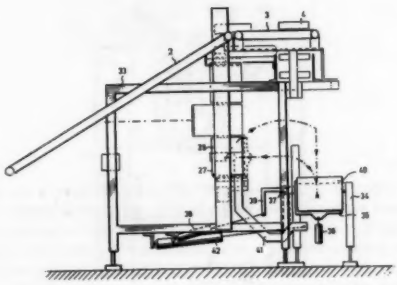
Gotlieb Benz, Flums, Switzerland, assignor to Machinenfabrik Flums AG, Flums, Switzerland

Filed Dec. 1, 1983, Ser. No. 556,794

Claims priority, application Switzerland, Dec. 8, 1982, 7133/82

Int. Cl.³ B65B *63/02, 35/40, 35/50*

U.S. Cl. 53—438 **10 Claims**



1. A method of packing a plurality of tubular bags in a box comprising the following steps:

(a) placing the tubular bags in layers between two lateral walls and one depth bounding wall and supported by a stepwise lowerable, rake-like main base;

(b) lowering the main base after a desired number of layers of tubular bags has been deposited thereon in order to deposit the tubular bags in an intermediate container which comprises an intermediate rake-like base, and a pair of side walls disposed outside of the lateral walls when the intermediate container is situated in an upper position;

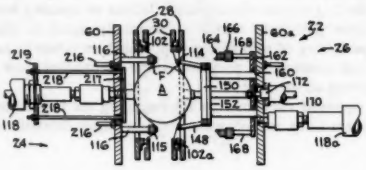
(c) lowering the intermediate container to a lower position and the main base to a position below the intermediate base;

(d) moving a box over the intermediate container; and
(e) depositing the tubular bags from the intermediate container into the box.

4,537,009
METHOD AND APPARATUS FOR PACKAGING ARTICLES SUCH AS FRUIT

William C. Kreamer, San Jose, Calif., assignor to FMC Corporation, Chicago, Ill.

Filed Sep. 14, 1982, Ser. No. 418,118
Int. Cl.³ B65B *47/04*
U.S. Cl. 53—441 **19 Claims**

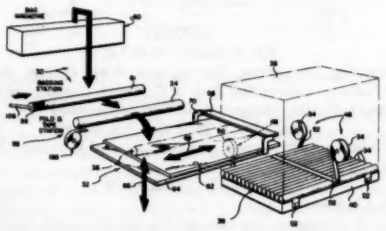


1. An apparatus for packaging articles within thermal sealing film, comprising:
means for capturing and firmly clamping first and second film portions between first and second outer pairs of film clamping annuluses,
feed means for moving an article between said captured film portions,
means for moving at least one of the first and second outer pairs of clamping annuluses toward the other for physically deforming the film portions into the general shape of the article by stretching the film portions over the article,
means defining inner clamping annuluses disposed inwardly of said outer annuluses for clamping the two film portions together at an inner film gripping plane and for providing an isolated annulus of film between said inner and outer clamping annuluses,
means for releasing said first and second outer pairs of clamping annuluses for removing tension from and relaxing said isolated annuluses of film, and
means for sealing the two portions of film together in the relaxed isolated annulus of film for sealing the first and second film portions together in an untensioned portion of the film.

4,537,010
PALLETIZING SYSTEM

Wallace W. Mojden, Hinsdale, and Robert E. Darr, Chicago, both of Ill., assignors to Fleetwood Systems, Inc., Countryside, Ill.

Filed Jan. 21, 1983, Ser. No. 459,978
Int. Cl.³ B65B *35/50*
U.S. Cl. 53—447 **35 Claims**

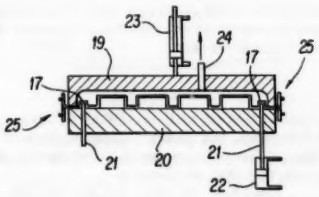


18. Apparatus for handling and bagging articles, such as can ends, and thereafter depositing filled bags of said article on a pallet member in such a manner as to provide one or more layers of filled, palletized bags, said apparatus including: receiving station means for providing individual stacks of articles disposed in facewise relationship; transport means for delivery of a stack of articles from said receiving station; bagging station means for receiving a stack of articles from said receiving station, and including means for disposing said stack of articles within a bag to provide a filled bag; collating station means for receiving and temporarily storing a predetermined number of filled bags received from said bagging station, with said filled bags being disposed in generally side-by-side horizontal disposition prior to palletizing such that the said predetermined number of filled bags will define a layer of palletized bags once deposited on a pallet member, and discharge means for discharging a layer of filled bags from said collating station means; palletizing station means including means for receiving a pallet member preparatory to the disposition of one or more layers of filled bags on said pallet member by said collating station means; and said palletizing station means further including tape dispensing means for interweaving a plurality of strips of tape between the respective layers of filled bags disposed on said pallet member to maintain the respective layers in palletized relationship during subsequent transport, said tape dispensing means comprising at least two tape support units upon which rolls of tape may be mounted; drive means for said tape support units for moving said support units transversely and horizontally of the palletizing station, the respective tape support units arranged to move oppositely of each other thereby to interweave at least two strips of tape between respective layers of filled bags, but with the strips of tape disposed in opposite alternating orientation with respect to each said layer.

4,537,011
VACUUM PACKAGING

Ermanno Bortolani, Legnano; Sandro Brembilla, Arese, both of Italy, and Enzo Vassarotti, Bugnaux S/Rolle, Switzerland, assignors to W. R. Grace & Co., Cryovac Div., Duncan, S.C.

Filed Nov. 26, 1982, Ser. No. 444,956
Int. Cl.³ B65B *11/52*
U.S. Cl. 53—509 **3 Claims**



1. Apparatus for vacuum packaging comprising:
(a) a vacuum chamber adapted to receive a support sheet and a cover film over the support sheet;
(b) means for evacuating a space between the cover film and support sheet to form a vacuum pack of the cover film sealed to the support sheet around a product article;
(c) upstanding adjustable rib-like means projecting into the chamber once the chamber is closed, said means defining a cover film collector to absorb cover film material which would otherwise form webbing on a product article being packed; and,
(d) means for retracting said rib-like means and for extending it into the chamber.

4,537,012

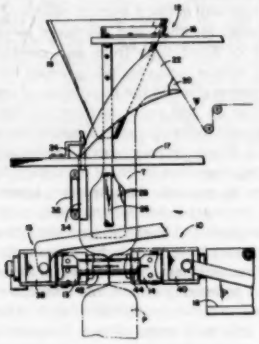
PACKAGING MACHINE WITH ROTARY ACTUATED SEALING JAWS

James S. Groom, Wales, and Paul J. LaFleur, Jr., Wilbraham, both of Mass., assignors to Package Machinery Company, East Longmeadow, Mass.

Filed Oct. 28, 1983, Ser. No. 546,744

Int. Cl.³ B65B *9/10, 51/30*

U.S. Cl. 53—552 17 Claims



1. In a sealing jaw mechanism for a packaging machine, the jaw mechanism having a pair of elongated parallel drawbars extending transversely of a given axis, a pair of opposing sealing jaws, each of said jaws being carried by an associated one of said drawbars, and rotary actuating means for moving said drawbars in one and an opposite direction relative to each other along said given axis to move said jaws between open and closed positions and including a pair of transversely spaced apart rotary actuating members supported for rotary movement about another axis extending transversely of said given axis, means for connecting said drawbars to said rotary actuating members to move in response to angular movement of said rotary actuating members, and drive means for imparting angular movement to said rotary actuating members, the improvement comprising said drive means including a pair of rotary actuators, each of said actuators having a drive shaft projecting from its opposite ends, means for coupling the inboard ends of the drive shafts to each other in coaxial alignment to rotate in unison, the axis of coupled driveshafts extending transversely of said given axis, each of said actuating members being connected to an outboard end portion of an associated one of said drive shafts.

4,537,013

BAG-FILLING APPARATUS

Konrad Tetenborg, and Heinz Eschmann, both of Lengerich, Fed. Rep. of Germany, assignors to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Nov. 17, 1982, Ser. No. 442,286

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1981, 3146319

Int. Cl.³ B65B *39/02, 39/04, 43/30*

U.S. Cl. 53—570 5 Claims

1. Bag filling apparatus comprising:

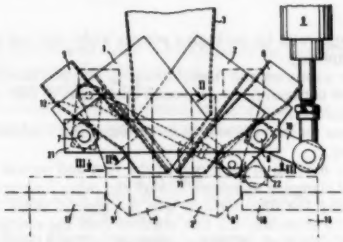
(a) a filling pipe having an axis and a filling outlet;

(b) a pair of opposed filling hopper halves positioned about the filling pipe and adjacent the filling outlet, said filling hopper halves pivotally supported for movement about respective spaced, parallel pivot axes, said filler hopper halves having lower portions defining spreading members adapted to engage the upper, inner surfaces of a bag;

(c) drive means for pivotally moving said filling hopper halves from a first position in which said spreader members are in an inward position to prevent flow of material into a bag positioned below said filling outlet, to a second position in which said spreader members are in an outward position to permit flow of material into a bag positioned below said filling outlet;

(d) opposed gripping means positioned below said filling pipe and on opposite sides of the axis thereof, said opposed gripping means lying on a line transverse to said pivot axes, said gripping means adapted to grip flat bags adjacent to their top edges and along side edges thereof and spaced a predetermined fixed distance from each other and on opposite edges of a bag, the spacing between said gripping means being less than the width of the bag to be gripped and sufficient to provide an ungripped portion of the bag which when opened defines an opening having an inner periphery that is substantially equal to the outer periphery of said filling hopper halves when in said second position, to prevent escape of product dust during filling of the bag;

(e) opposed vacuum cups for engaging the bag on opposite outer sides and adjacent the top edges thereof, said opposed vacuum cups lying on a line substantially perpendicular to and substantially equidistant from the line on which said gripping means lie and movable away from the bag to draw the sides thereof apart to provide a filling opening;



(f) said drive means being operative to pivot said filling hopper halves into the second position so that they act against inner surfaces of drawn-apart sides of the bag after release of vacuum from the vacuum cups, to provide a bag opening of uniform size independent of bag widths that are greater than the spacing between the opposed gripping means; and

(g) said spreading members including outwardly protruding end walls, the outmost points of which lie on a line connecting said gripping means, each of said filler hopper halves having side walls that extend toward the opposite filler hopper half, the side walls overlapping each other in a direction along the axis of the filling pipe when the filling hopper halves are in the second position to prevent the escape of dust therebetween.

4,537,014

PACKAGING MACHINE

Hans-Jörg Emmerling, Kürten, and Josef Hamm, Bergisch Gladbach, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 7. 1982, Ser. No. 375,910

Claims priority, application Fed. Rep. of Germany, May 7, 1981, 3118078

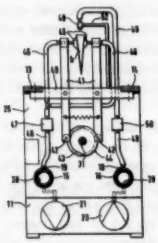
Int. Cl.³ B65B *43/26*

U.S. Cl. 53—570 2 Claims

1. A packaging machine having an elongated frame provided with two rigid apertured end walls with a lower end that forms feet and an upper portion; two support beams connected to said end walls at the upper portion along an edge thereof; at least one support plate secured between two support beams, a suction means supported by said plate for opening a bag to be

filled and air blowing means to blow air into said bag for opening said bag;

a plurality of spaced, apertured, plate-like intermediate walls of identical shape disposed between said end walls parallel thereto and extending from and fixedly secured to said two support beams; at least two spaced, longitudinal, cylindrical tubular members which protrude through said apertures in said intermediate walls and said end walls at a lower portion of said end walls between said feet and said upper portion thereof, and said at least two tubular members are fixedly secured to said plurality of plate-like intermediate walls and to each of said end walls said tubular members are provided with end cap members on the portions protruding through said endwalls, means for connecting one of said tubular memebers to said suction means and for connecting said blowing means to a different tubular member, said cap members arranged to receive connections for connecting a compressed air means to said one of said tubular members and to connect an underpressure means to said different tubular member.



4,537,015

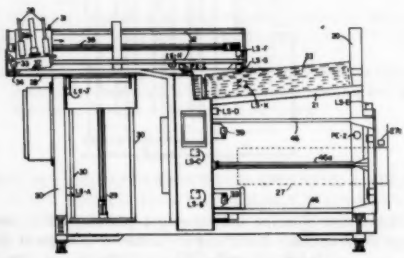
BAG PLACER FOR A PACKAGING MACHINE

Wilfred L. Inglett, Jr.; Walter M. Ashley, Jr., both of Augusta, and Abe J. Manfredonia, Evans, all of Ga., assignors to Inglett & Company, Inc., Augusta, Ga.

Filed Sep. 2, 1983, Ser. No. 529,113

Int. Cl.[3] **B65B** *43/18, 43/30, 43/46*

U.S. Cl. 53—386 **3 Claims**



1. Apparatus to place a bag on a spout to receive a tightly compressed material comprising:

a magazine to hold a stack of bags said bags having open ends and closed ends and with their closed ends facing toward the center of the apparatus;

a spout positioned below the magazine, the said spout having expandable jaws to grip a bag with one end of the spout adapted to receive the open end of a bag and the opposite end of the spout adapted to receive the compressed material;

an elevator to hold a bag lengthwise moveable between an up position adjacent the magazine and a down position aligned with the spout;

a gripper arm moveable from a position over the closed ends of the bags on the magazine lengthwise of the elevator, the said gripper arm having grippers extendable into the magazine to grip and lift the closed end of the top bag in the stack;

means to move the gripper bar and the bag held by the grippers along the elevator and place the bag on the elevator;

means to lower and raise the elevator;

upper and lower opening bars provided with vacuum cups facing each other positioned adjacent the bag end of the spout;

means to move the elevator and bag horizontally to bring the open end of the bag between the opening bars to permit the opening vacuum cups to grip opposite faces of the open end of the bag;

means to separate the opening bars and open the bag;

a finger assembly comprising a pair of bars moveable horizontally on stationary rods along the opposite faces of the spout and fingers adapted to rotate into the mouth of the bag when the bag is almost opened and grip the bag;

means to move the bars of the finger assembly and the bag gripped by the finger onto the spout for substantially the full length of the bag; and

means to expand the jaws of the spout;

whereby the bag will be held on the spout ready to receive the compressed material through the spout and then be pushed from the spout.

4,537,016

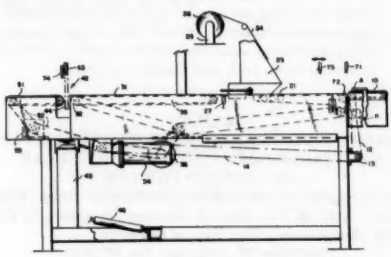
HORIZONTAL FORM, FILL, SEAL MACHINES

Frank G. Shanklin, Groton, Mass., and Francis X. King, Nashua, N.H., assignors to Shanklin Corporation, Ayer, Mass., by said Francis Xavier King, Jr.

Filed Dec. 30, 1982, Ser. No. 454,688

Int. Cl.[3] **B65B** *9/06, 51/26;* **B65G** *47/31*

U.S. Cl. 53—493 **21 Claims**



1. A continuous run horizontal form fill seal wrapping machine operable to uniformly space wrap and seal discrete product units without use of flighted conveyors comprising:

an infeed conveyor and a transfer conveyor arranged in horizontal in-line sequence to move discrete units of product through the machine;

a film forming head adapted to form film received from a roll of film on an unwind stand into a tube surrounding said product as it moves on said transfer conveyor;

means for supporting said transfer conveyor below said infeed conveyor to provide a vertical offset between the discharge end of said infeed conveyor and the adjacent input end of said transfer conveyor, the amount of vertical offset being sufficient to enable detection of drop of the trailing edge of product delivered by said infeed conveyor onto said transfer conveyor;

control means for said conveyors comprising:

means for normally running said infeed conveyor;

means responsive to the arrival of product at the discharge

end of said infeed conveyor for running said transfer conveyor;

means responsive to detecting said drop for stopping said infeed conveyor until said transfer conveyor has run a predetermined distance afer said drop for producing predetermined spacing between sequential units of product on said transfer conveyor;

means responsive to absence of product on said infeed conveyor for maintaining said transfer conveyor stopped after it has run said predetermined distance and until product again arrives at the discharge end of said infeed conveyor for preventing said stopping of said infeed conveyor until the next arrival of product at said discharge end of said infeed conveyor;

an end sealing mechanism for said wrapping machine having:

a carriage mounted on said machine for reciprocating longitudinal motion along the direction of travel of the continuous stream of spaced units of product enclosed in said tube of film, said tube delivered by a conveyor belt to pass through said end sealing mechanism;

upper and lower sealing jaws mounted on said carriage for movement transverse to said longitudinal motion above and below the path of said tube containing said product;

brake means operable to engage said carriage to said conveyor belt to move said carriage with said tube as it travels through said mechanism;

actuator means for closing said sealing jaws on said tube in the space between said units as said carriage travels with said film and thereafter opening said jaws, said jaws when closed simultaneously sealing the ends of said tube and severing the film tube between successive units of product;

pneumatic actuators operable for returning said carriage in the opposite direction to the travel of said film; and

control means for operating said brake means and said actuator means to close said jaws on said film tube between said units while said carriage moves with said film tube to seal and sever said film and reopen said jaws after the film tube is sealed and severed, said control means releasing said brake means and energizing said pneumatic actuators to return said carriage as soon as said jaws reopen, said conveyor belt driven and stopped in synchronism with said transfer conveyor.

4,537,017

MACHINE FOR FILLING JARS WITH PIECES OF VEGETABLES OR FRUITS, IN PARTICULAR QUARTERED PICKLES

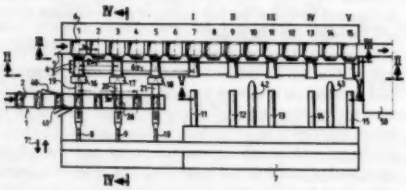
Eckart Hengstenberg, Esslingen, and Heinrich Disch, Hohengehren, both of Fed. Rep. of Germany, assignors to Firma Rich. Hengstenberg, Fed. Rep. of Germany

Filed May 23, 1983, Ser. No. 497,385

Claims priority, application Fed. Rep. of Germany, May 22, 1982, 3219340

Int. Cl.³ B65B *5/10*

U.S. Cl. 53—515 **6 Claims**



1. A machine for filling jars with pieces of vegetables or fruits, and in particular quartered pickles, comprising:

a plurality of cutting stations;

a conveyor belt on which the vegetables or fruits are carried in a horizontal position and by which they are carried and moved in increments to the cutting stations, while the horizontal orientation is maintained;

a plurality of filling stations;

a magazine conveyor belt defining a path of travel, on which a plurality of magazines are carried and moved incrementally to the cutting statons and the filling stations, each magazine being provided with a partition for dividing the spaced within the magazine into two portions;

means for cutting the vegetables or fruits at the cutting stations into pieces and for feeding the cut pieces into the magazines at the cutting stations, such that a portion of the cut pieces at each cutting station are received within one portion of an associated magazine and rest on the partition thereof and the remainder of the cut pieces at each cutting station are received within the other portion of the associated magazine;

a jar conveyor belt having an upper horizontal plane defining a path of travel, on which a plurality of jars are carried and moved incrementally to the filling stations; and

means for feeding the cut pieces from the magazines at the filling stations into the jars at the filling stations, wherein:

(i) the path of travel of the magazine conveyor belt is disposed parallel relative to the path of travel of the jar conveyor belt and obliquely relative to said horizontal plane, such that

(ii) the height of the magazine relative to a jar varies at each filling station.

4,537,018

APPARATUS FOR SLIVER CAN CONTROLLING IN A SPINNING MILL

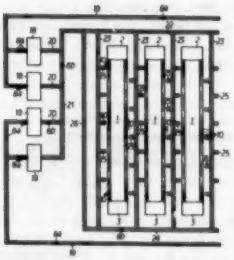
Takuzo Tooka, Toyoake, Japan, assignor to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Oct. 20, 1983, Ser. No. 543,914

Claims priority, application Japan, Oct. 23, 1982, 57-186544

Int. Cl.³ D01H *9/18, 13/24, 13/32*

U.S. Cl. 57—90 **6 Claims**



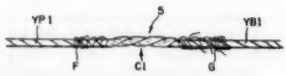
1. In a yarn spinning mill having a plurality of drawing frames for producing sliver, and a plurality of elongated spinning machines each having a plurality of spinning stations along its length, each said spinning station having means for spinning yarn from sliver drawn from a supply thereof within a removable sliver can adjacent to the station, the improvement comprising detecting means for detecting any one of said sliver cans adjacent to said spinning stations in which said sliver supply has been substantially exhausted by said yarn spinning at the spinning station, said detecting means comprising spun yarn length measuring means including yarn-breakage sensing means associated with each said spinning station and which together detect when said sliver supply adjacent to said station is substantially exhausted; sliver can delivery means operable responsive to said detecting means for delivering respective sliver cans, each containing said supply of sliver, from said drawing frames to adjacent any of said spinning

stations at which said sliver supply is substantially exhausted, said sliver can delivery means comprising conveyor means including respective distributing tracks extending from said drawing frames, respective supply tracks branching from respective ones of said distributing tracks, each said supply track extending along the length of one of said spinning machines for conveying a sliver can to adjacent any one of its said spinning stations, sliver can transfer means at each branch point between any said distributing track and any said supply track branching therefrom, and a plurality of sliver can stop means on each said supply track for stopping a delivered sliver can substantially adjacent to any selected spinning stations therealong; and control means operable responsive to said detection by any of said spun yarn length measuring means for determining a route, and actuating said conveyor means along such route between said drawing frames and said spinning station associated with said yarn length measuring means to automatically deliver a sliver can to the spinning station.

4,537,019
SPLICED JOINT OF SPUN YARNS

Isamu Matsui, and Hiroshi Mima, both of Kyoto, Japan, assignors to Murata Kikai Kabushiki Kaisha, Japan

Filed Mar. 19, 1982, Ser. No. 359,789
Claims priority, application Japan, Mar. 25, 1981, 56-44547
Int. Cl.³ D01H *15/00*
U.S. Cl. 57—202 **13 Claims**



1. A joint of a spun yarn, said yarn having an inherent twist direction, comprising:

a spliced region formed by overlapping two yarn ends of said spun yarn in opposing directions and jetting a compressed fluid centrally on the region of overlap such that fibers of the two yarn ends are integrated by swirling within the jetted compressed fluid, in a controlled manner, to form one yarn within the spliced region, said spliced region comprising:

a first joint portion, having twists in the same twisting direction as the twisting direction of inherent twists of the spun yarn; and

a second joint portion, having twists in a twisting direction opposite to the twisting direction of inherent twists of the spun yarn;

and having wrapping fibers, formed of loose ends of the two yarn ends, entangled with one another around the spun yarn at adverse ends of the spliced region.

4,537,020
PROCESS AND APPARATUS FOR SPINNING A STAPLE FIBER JOINED TO A PREVIOUSLY SPUN YARN

Helmut Fuchs, Linz, Austria, assignor to Textilmaschinenfabrik Dr. Ernst Fehrer Aktiengesellschaft, Leonding, Austria

Filed Jan. 4, 1985, Ser. No. 688,905
Claims priority, application Austria, Jan. 19, 1984, 160/84
Int. Cl.³ D01H *15/02*
U.S. Cl. 57—263 **15 Claims**

1. In a process of spinning a staple fiber yarn joined to a previously spun staple fiber yarn comprising

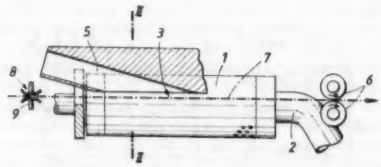
providing two juxtaposed solids of revolution having peripheral surfaces which define an elongate nip and a generally triangular space tapering to said nip,

providing in a predetermined region of said triangular space a joint-forming portion of said previously spun yarn extending into said triangular space from one end thereof,

sucking air from said triangular space near said nip in said predetermined region, rotating said solids of revolution in a first sense, supplying singled staple fibers to said triangular space in said predetermined region so that said fibers contact said joint-forming portion, and withdrawing said previously spun yarn from said triangular space at said one end thereof, said sucking, rotating, supplying and withdrawing being performed at the same time so that said fibers are twisted together to form a newly spun yarn joined to said joint-forming portion,

the improvement residing in that

said previously spun yarn is placed into said trianglar space so that a rear end portion of said previously spun yarn



protrudes from said triangular space at the other end thereof,

said previously spun yarn is untwisted in said predetermined region to form an untwisted portion,

said previously spun yarn is tensioned to detach,

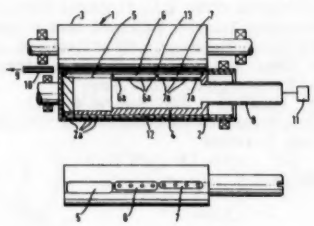
said rear end portion from said untwisted portion to form the latter in said predetermined region with a thinned-out, untwisted fiber tuft, which constitutes said joint-forming portion, and

said rear end portion is removed from said triangular space.

4,537,021
FRICTION SPINNING

Alan Parker, Bolton, England, assignor to Hollingsworth (U.K.) Limited, United Kingdom

Filed Jun. 11, 1984, Ser. No. 618,974
Claims priority, application United Kingdom, Jun. 15, 1983, 8316341; Feb. 2, 1984, 8402838
Int. Cl.³ D01H *7/898*
U.S. Cl. 57—401 **10 Claims**



1. In friction spinning apparatus comprising:

(a) co-operating first and second movable surfaces of which at least said first surface is perforated, said first and second surfaces defining a yarn formation line transverse to which the first and second surfaces move;

(b) suction means to generate suction within said first surface along a line thereof perpendicular to the direction of movement of the perforated surface; and

(c) means for withdrawing yarn from said co-operating surfaces along a yarn formation line parallel to said suction line;

the improvement wherein said suction means are effective to ensure that the static pressure within said first surface is different at different locations along said suction line and the static pressure reduces in the yarn withdrawal direction so that weaker suction is exerted at the tip of the forming yarn than at a downstream portion thereof.

4,537,022

ADJUSTABLE BEARING SUPPORT FOR OPEN-END FRICTION SPINNING ROLLERS

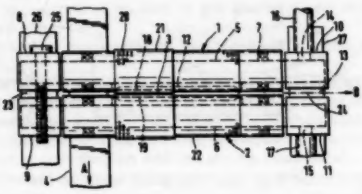
Fritz Stahlecker, Josef-Neidhart-Strasse 18, 7347 Bad Überkingen, Fed. Rep. of Germany, assignor to Hans Stahlecker and Fritz Stahlecker, both of, Fed. Rep. of Germany

Filed Jul. 25, 1984, Ser. No. 634,131

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1983, 3331195

Int. Cl.³ D01H 7/882

U.S. Cl. 57—401 14 Claims



1. Friction roller support apparatus for open end friction spinning machines of the type having two friction rollers arranged next to one another forming a wedge shaped yarn forming gap therebetween, said support apparatus comprising:

a pair of non-rotating axle means and bearing means rotatably supporting the respective friction rollers on the axle means,

four holding means arranged in pairs and at opposite ends of the friction rollers including receptacle means for receiving the axle means,

and adjusting screw means disposed between one pair of holding means, said adjusting screw means extending transverse to the longitudinal extension of the wedge shaped gap and being operable to adjust the spacing of the holding means with respect to one another to thereby adjust the size of the wedge shaped gap.

4,537,023

REGENERATIVE GAS TURBINE CYCLE

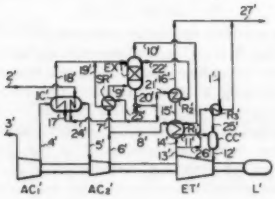
Hiromi Nakamura; Takehiko Takahashi, both of Chiba; Norio Narazaki; Kazuo Yamamoto, both of Kanagawa, and Norio Sayama, Chiba, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Dec. 9, 1982, Ser. No. 448,322

Claims priority, application Japan, Dec. 10, 1981, 56-199362; Dec. 10, 1981, 56-199364

Int. Cl.³ F02C 7/00

U.S. Cl. 60—39.05 11 Claims



1. In a method for the operation of a regenerative gas turbine cycle with water addition wherein heat recovery is carried out by a single-phase and multi-component mixture of compressed gaseous medium/steam (hereinafter referred to as "SPCM") and cooled water which are obtained through a containing operation comprising the steps of,

compressing a gaseous medium to a predetermined pressure;

contacting the compressed gaseous medium with heated water so that the SPCM and the cooled water are obtained;

recovering heat from an exhaust gas to heat the SPCM;

recovering heat from an exhaust gas to heat a part of the cooled water;

burning fuel together with heated SPCM while mixing it;

driving a gas turbine for production of power;

discharging the exhaust gas after heat recovery; and,

supplying water corresponding to the amount of water which is lost by evaporation;

said step of contacting the compressed gaseous medium with heated water being preceded by a step of after-cooling the compressed gaseous medium by the remainder of the cooled water being obtained through the contacting operation.

4,537,024

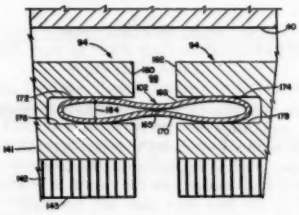
TURBINE ENGINES

William C. Grosjean, Poway, Calif., assignor to Solar Turbines, Incorporated, San Diego, Calif.

Continuation of Ser. No. 32,485, Apr. 23, 1979, abandoned, which is a continuation of Ser. No. 862,279, Dec. 19, 1977, abandoned. This application Sep. 14, 1982, Ser. No. 418,019

Int. Cl.³ F02C 7/28

U.S. Cl. 60—39.161 18 Claims



1. A gas turbine comprising: a nozzle case through which heated gases are adapted to flow; a segmented, annular, stationary component in and supported from said nozzle case; and means for sealing the gaps between adjacent segments of said component to keep the heated gases from escaping through said gaps, said last-mentioned means comprising seals which are of monometallic, sheet metal construction and have a concave cross-section and arcuate edge portions, each said seal extending longitudinally with respect to, and sealing the gap between, two adjacent segments at both ambient and higher operating temperatures and each said seal being oriented with its major cross-sectional dimension orthoganally related to the axial centerline of the segmented component and to a radius extending from said centerline through the gap between said segments.

4,537,025

ELECTRONIC FUEL CONTROL WITH MANUAL TRAINING MODE

George D. Cropper, Newington, and Anthony J. Gentile, Waterbury, both of Conn., assignors to Chandler Evans, Inc., West Hartford, Conn.

Division of Ser. No. 420,139, Sep. 20, 1982, Pat. No. 4,478,038. This application Jun. 25, 1984, Ser. No. 624,220

Int. Cl.³ F02C 9/28

U.S. Cl. 60—39.281 3 Claims

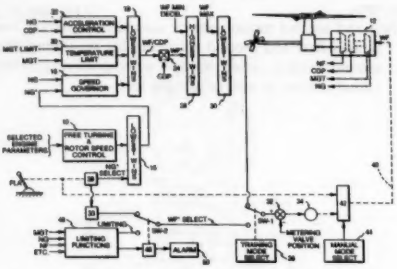
1. In a fuel control for a gas turbine engine, the fuel control being operable in either an automatic or a manual mode, the fuel control including a fuel metering valve which is automatically adjusted in response to a control signal delivered to a motor to provide an appropriate fuel flow rate in the automatic

mode, the metering valve being manually adjusted in response to movements of an operators control member in the manual mode, the improvement comprising:

means for selectively operating the fuel control in a training mode which simulates the manual control mode, said training mode operating means including:

means for generating command signals commensurate with the movements of the operators control member;

training mode selector means for applying either said command signals or the automatic mode control signals to the metering valve adjusting motor;



means responsive to signals commensurate with a plurality of monitored engine operating parameters for generating a fuel flow limit signal and an alarm signal commensurate with a monitored engine operating parameter approaching its safe operating limit; and

switch means responsive to said alarm signal for delivering either a limit signal or said command signals to said selector means whereby said command signals will be delivered to the motor in the training mode under normal operating conditions and a limit signal will be delivered to the motor in the training mode when the operator's actions as applied to the control member have been inappropriate.

4,537,026

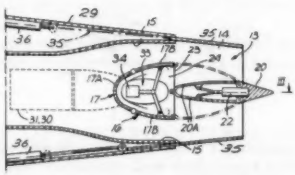
VARIABLE AREA NOZZLES FOR TURBOMACHINES

Douglas J. Nightingale, Atlanta, Ga., assignor to Rolls-Royce Inc., New York, N.Y.

Continuation of Ser. No. 366,391, Apr. 7, 1982, abandoned. This application Sep. 25, 1984, Ser. No. 654,520

Int. Cl.³ F02K *1/08*; B64D *33/04*

U.S. Cl. 60—264 **3 Claims**



1. A jet propulsion powerplant comprising:

a gas producer;

a first flow duct for efflux of said gas producer, said first flow duct including a nozzle at the downstream end thereof;

a center body positioned within said nozzle and having an interior chamber, said center body including an upstream part and a downstream part, said upstream part including a fixed forward portion and an expandable and contractible downstream portion, said downstream part having an expandable and contractible upstream portion selectively operable to coact and move with said downstream portion of said upstream part to vary the cross-sectional area of said nozzle of said first flow duct and to contract and move relative to said downstream portion of said upstream part to provide communication between said chamber and said first flow duct;

means for expanding and contracting said downstream portion of said upstream part and said upstream portion of said downstream part, said means including a first means operatively connected to said downstream portion of said upstream part for expanding and contracting the same and a second means operatively connected to the said upstream portion of said downstream part for expanding and contracting the same, said first means and said second means being capable of simultaneous operation to simultaneously expand and contract said downstream portion of said upstream part and said upstream portion of said downstream part, said second means being capable of operation independently of said first means to contract said upstream part of said downstream portion relative to said downstream portion of said upstream part to provide the communication between said chamber and said first flow duct;

a second flow duct having an inlet for air flow and an outlet opening into said chamber of said center body;

and means to open and close said second flow duct, said last mentioned means including a door operatively closing said second flow duct and a motor operatively connected to said door, said motor being operable to open said door of said second flow duct for air flow therethrough when said upstream portion of said downstream part has been contracted relative to said downstream portion by said second means.

4,537,027

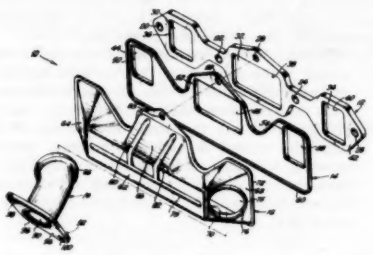
HYBRID EXHAUST MANIFOLD

Jon W. Harwood; Michael W. Clegg, and Mark C. Treadwell, all of Toledo, Ohio, assignors to APX Group, Inc., Toledo, Ohio

Filed Nov. 21, 1983, Ser. No. 554,127

Int. Cl.³ F01N *7/10*

U.S. Cl. 60—323 **14 Claims**



1. A hybrid exhaust manifold for an engine having a plurality of cylinders which are operative to generate exhaust gases, said manifold comprising:

a generally planar inlet flange adapted to be mounted on the engine and having at least one exhaust port extending therethrough, said exhaust port being generally in register with at least one of said cylinders when said inlet flange is mounted on the engine;

a stamp formed sheet metal inner shell including at least one planar portion, said planar portion of said inner shell being mounted adjacent to said planar inlet flange, said inner shell further including an inlet aperture for each said exhaust port, said inlet aperture extending through the planar portion of said inner shell and being substantially the same size and configuration as the corresponding exhaust port, said inlet aperture being defined by a stamp

formed mounting flange unitary with the inner shell and extending generally normal to the planar portion thereof, the mounting flange extending into and telescopingly engaging the corresponding exhaust port;

a stamp formed sheet metal outer shell fixedly attached to said inner shell, said inner and outer shells being configured to define an exhaust chamber therebetween, said outer shell including an outlet aperture extending therethrough; and

an outlet tube fixedly attached to said outer shell adjacent said outlet aperture, whereby when said inlet flange is mounted on the engine, exhaust gases generated by the cylinders enter the exhaust chamber through the inlet aperture and exit the exhaust chamber through the outlet aperture and outlet tube.

4,537,028

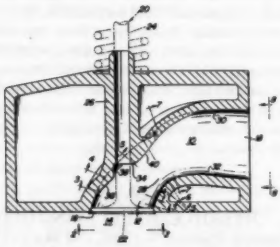
EXHAUST PORT

Albert L. Humke, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Aug. 8, 1983, Ser. No. 520,924

Int. Cl.³ F02F *1/42*

U.S. Cl. 60—272 **9 Claims**



1. In an internal combustion engine having a cylinder closed at one end, an exhaust port communicating with the cylinder through the closed end and a poppet exhaust valve disposed in the port and having head and stem portions reciprocal along an axis for controlling communication of the cylinder with the exhaust port, the exhaust port comprising:

a wall having a first flow-divider projecting therefrom upstream of the valve stem, the first flow-divider merging gradually and smoothly with the wall in a direction away from the valve stem, the wall also having a second flow-divider projecting therefrom downstream of the valve stem, the second flow-divider merging gradually and smoothly with the wall in a direction away from the valve stem, the flow-dividers cooperating to reduce turbulence in gasses flowing through the exhaust port and around the valve stem.

4,537,029

POWER TRANSMISSION

Rajamouli Gunda, Rochester; Michael R. McCarty, Troy, and Melvin A. Rode, W. Bloomfield, all of Mich., assignors to Vickers, Incorporated, Troy, Mich.

Filed Sep. 23, 1982, Ser. No. 421,817

Int. Cl.³ F15B *9/09*; F16H *39/46*

U.S. Cl. 60—390 **6 Claims**

1. A system for controlling distribution of hydraulic power between first and second applications comprising

hydraulic pump means responsive to electrical pump control signals for controlling hydraulic output of said pump means,

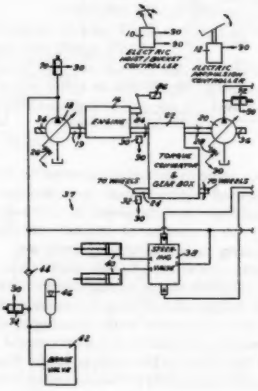
first and second motive actuators for respectively performing first and second hydraulic power applications,

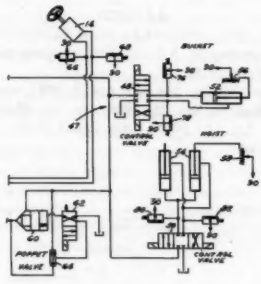
first and second hydraulic valve means responsive to first and second electrical valve control signals for connecting said pump means to said first and second actuators respectively,

first and second operator control means respectively associated with said first and second applications, said control means including means for sensing operator motion demands at said first and second applications and means for providing first and second demand signals as a respective function of such operator demands,

first and second pressure sensor means respectively coupled to said first and second motive actuators for providing first and second pressure sensor signals as respective functions of hydraulic pressure at said first and second actuators,

first and second motion sensor means respectively coupled to said first and second actuators for providing first and second motion sensor signals as respective functions of actual motion at said actuators, and





electronic control means responsive to said first and second demand signals from said operator control means and to said first and second motion sensor signals from said motion sensor means for providing said pump control signals, and said first and second valve control signals as a function of total operator demand,

said control means including means responsive to the sum of said first and second demand signals for operating said pump means to satisfy total operator demand at said first and second applications, means for each said application responsive to said first and second demand signals and to said first and second motion sensor signals for controlling said first and second valve means so as to proportion output of said pump means between said first and second

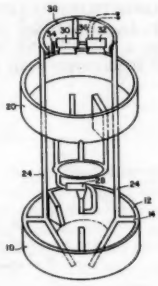
actuators, and means responsive to said first and second pressure signals for completely opening the said valve means associated with the greater pressure at said first and second actuators and modulating the other of said valve means associated with the lesser of said pressures to provide demand motion at each of said actuators.

4,537,030

OCEAN THERMAL ENERGY SYSTEM

Daniel Berman, Rehov Harav Friedman 49, Tel Aviv, Israel

Filed Dec. 3, 1982, Ser. No. 446,649
Int. Cl.³ F03G *7/04*
U.S. Cl. 60—641.7 **1 Claim**



1. A method of generating electrical energy from ocean thermal energy comprising:

pressurizing a working fluid at a low temperature in a relatively cool, deep layer of ocean water;

conducting said fluid through thermally conductive working fluid conduits disposed so as to pass through progressively warmer layers of ocean water such that said fluid is preheated by absorbing heat from said ocean water;

heating said preheated fluid to a hot gas in a thermally conductive working fluid heating compartment disposed in a shallower, warmer layer of ocean water by heat transference from said ocean water;

causing said hot gas to pass through generating means so as to generate electrical energy;

conducting said hot gas from said generating means through thermally conductive exhaust conduits disposed so as to pass through progressively cooler layers of ocean water such that said gas is cooled by releasing heat to said ocean water; and

cooling and condensing said gas in a thermally conductive working fluid cooling compartment disposed in a deep, cool layer of ocean water by heat transference to said ocean water;

the preceding steps being conducted in the absence of a step of circulating ocean water relative to said compartments.

4,537,031

POWER CYCLES BASED UPON CYCLICAL HYDRIDING AND DEHYDRIDING OF A MATERIAL

Lynn E. Terry, 22 Suncrest Ave., Bridgeton, N.J. 08302, and Roger J. Schoeppel, P.O. Box 971, Stillwater, Okla. 74074

Division of Ser. No. 126,377, Mar. 3, 1980, Pat. No. 4,397,153, which is a division of Ser. No. 900,769, Apr. 27, 1978, Pat. No. 4,198,827, which is a division of Ser. No. 666,786, Mar. 15, 1976, Pat. No. 4,090,361. This application Aug. 5, 1982, Ser. No. 405,422
Int. Cl.³ F01K *25/06*
U.S. Cl. 60—649 **3 Claims**

1. The method for deriving power from a low-grade thermal energy course comprising:

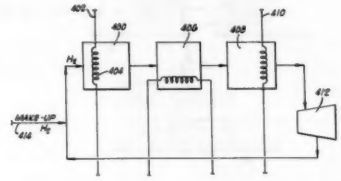
combining hydrogen gas with a first hydride-forming material under conditions of temperature, T_1, and a pressure, P_1, such that a first hydride saturated with, and in equilibrium with, hydrogen gas is formed;

heating the first hydride at constant volume to a temperature above the equilibrium temperature of the hydride to chemically compress the hydrogen gas;

transferring heat to said first hydride and concurrently releasing hydrogen gas therefrom under a pressure, P_2, which is higher than pressure, P_1;

cooling the released hydrogen gas from the first hydride material to a temperature, T_2;

combining the cooled hydrogen gas at temperature, T_2, with a second hydride-forming material under a pressure, P_2, such that a second hydride saturated with, and in equilibrium with hydrogen gas is formed, said equilibrium pressure, P_2, being higher than P_1;



heating the second hydride at constant volume to a temperature above the equilibrium temperature, T_3, to chemically compress the hydrogen gas;

transferring heat to the second hydride and concurrently releasing the hydrogen gas therefrom;

expanding the hydrogen gas released from said second hydride through a power producing expansion device to produce power and cool the hydrogen gas to a temperature at least as low as the hydride equilibrium temperature, T_1, of said first hydride-forming material; and

recycling said cooled hydrogen gas following expansion to the zone of combination of hydrogen gas with said first hydride-forming material; and

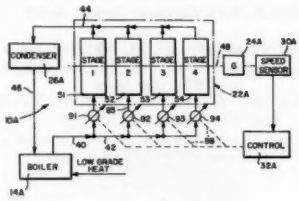
cyclically repeating the foregoing steps.

4,537,032

PARALLEL-STAGE MODULAR RANKINE CYCLE TURBINE WITH IMPROVED CONTROL

Uri Kaplan, Rehovot, Israel, assignor to Ormat Turbines (1965) Ltd., Yavne, Israel

Filed Apr. 19, 1983, Ser. No. 486,498
Int. Cl.³ F01K *13/02*
U.S. Cl. 60—662 **6 Claims**



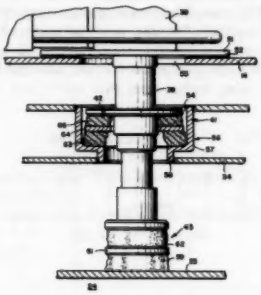
1. A method for controlling the load on a Rankine cycle power plant comprising a plurality of modular turbine units to which vaporized working fluid from a boiler is supplied in parallel through respective throttle valves, and from which exhausted vapor is removed in parallel, said method comprising the step of controlling the operation of each throttle valve such that under any load condition, only one throttle valve at a time is variable and all of the other valves are either fully open or fully closed.

4,537,033

CRYOGENIC MAGNET SYSTEMS

Zvi Kamil, Tel Aviv, Israel, assignor to Elscint Ltd., Haifa, Israel

Filed Feb. 10, 1984, Ser. No. 579,010
Claims priority, application Israel, Mar. 15, 1983, 68138
Int. Cl.³ F25B 21/02
U.S. Cl. 62—3 14 Claims



1. An improved cryogenic superconductive magnet system for use in nuclear magnetic resonance (NMR) devices, said system comprising:

(a) a cryogenic superconducting electro-magnet immersed in a first tank containing a first liquified gas;

(b) said first tank being mounted in a vacuum container;

(c) heat radiation shielding means surrounding said first tank in said vacuum container;

(d) a refrigerator system external to said vacuum container, said refrigerator system including refrigerant means, and means for compressing said refrigerant means;

(e) coupling means comprising cold head means for carrying said compressed refrigerant means to said heat radiation shielding means to remove heat from said heat radiation shielding means; and

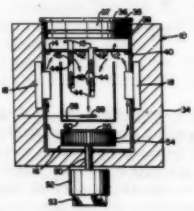
(f) said cold head means comprising heat transferrable mesh means attached to said cold head means to be between said cold head means and said heat shielding means and in contact with said heat shielding means for increasing the area of direct contiguity between said cold head means and said heat shielding means.

4,537,034

METHOD FOR CONTROLLED REDUCTION IN TEMPERATURE AND PRESERVATION OF EMBRYOS IN A CRYOGENIC STATE

Michael D. Crouch, 9312 Highland Garden, Baton Rouge, La. 70811

Division of Ser. No. 402,840, Jul. 29, 1982, Pat. No. 4,459,825.
This application Jun. 14, 1984, Ser. No. 620,501
Int. Cl.³ F25D 25/00
U.S. Cl. 62—62 4 Claims



1. The method of freezing embryos at a controlled rate from room temperature to cryogenic temperatures on the order of −50° C. comprising the steps of:

providing an insulated, sealed chamber in which said embryos are removably supported;

positioning a heat transfer medium in said chamber;

recirculating air under pressure through said chamber along a closed path into direct contact with said heat transfer medium followed by passing said air across said embryos to progressively reduce the temperature in said chamber to a cryogenic temperature on the order of −50° C.; and

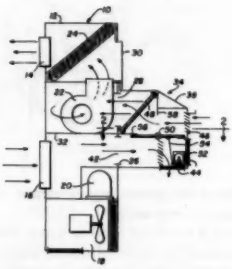
programming the rate of cooling of said air by regulating the temperature of said heat transfer medium.

4,537,035

AIR CONDITIONING SYSTEM

Jack L. Stiles, 3912 E. Acapulco, Irving, Tex. 75062

Filed May 4, 1984, Ser. No. 607,185
Int. Cl.³ F25B 29/00; F25D 17/04
U.S. Cl. 62—89 7 Claims



7. A method for increasing the efficiency of a thin-line air conditioner having a blower, a compressor, a return air filter located in an opening between said blower and compressor and having an access opening adjacent to said blower closed by an access panel, said method comprising the steps of:

removing the access panel;

removing the filter;

closing the opening between the blower and compressor;

pivotally attaching an air control housing to said air conditioner with an outlet in said housing disposed adjacent to the access opening;

sensing the ambient temperature;

transmitting a signal related to said sensed temperature to a control motor; and,

positioning a control member to admit only recirculated air to said blower in response to one signal, to admit only fresh air to said blower in response to another signal, and to admit a mixture of recirculated and fresh air in response to still another signal.

4,537,036

THERMALLY POWERED HEATING SYSTEM

Robert W. Clark, III, 2232 W. Joan de Arc Ave., Phoenix, Ariz. 85029

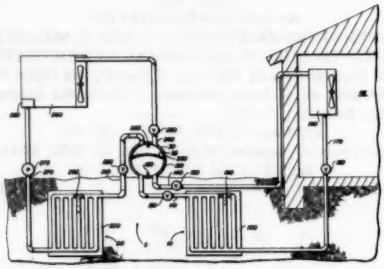
Filed Sep. 27, 1984, Ser. No. 654,725
Int. Cl.³ F25B 1/00
U.S. Cl. 62—116 20 Claims

1. A thermally powered heat transfer system having a first and a second cycle of operation, comprising:

first and second closed loop heat transfer means each of said transfer means including respectively a first and a second refrigerant, a first and a second condenser means for transferring heat from the first and second refrigerants to a first and a second heat sink, said heat sinks being separate from each other, a first and a second heat exchanger for transfer-

ring heat from a common heat source to the first and the second refrigerants, the temperatures ofthe first heat sink being above that of the common heat source and the temperature of the second heat sink being below that of the common heat source;

compressor means for said first and second heat transfer means powered by energy derived from the common heat source



for causing said second condenser means to transfer heat from the second refrigerant to the second heat sink during each first cycle of operation and powered by energy derived from the common heat source for causing said first condenser means to transfer heat from the first refrigerant to the first heat sink during each second cycle of operations; and

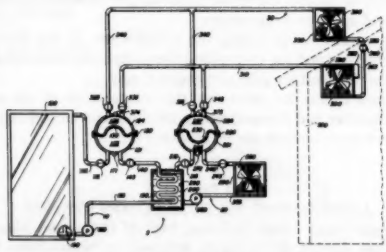
control means for causing such system to change its cycle of operation.

4,537,037

THERMALLY POWERED HEAT TRANSFER SYSTEMS UTILIZING SEQUENTIAL DISPLACEMENT

Robert W. Clark, Jr., 2232 W. Joan de Arc Ave., Phoenix, Ariz. 85029

Filed Oct. 31, 1984, Ser. No. 666,742
Int. Cl.³ F25B *1/00*
U.S. Cl. 62—116 **15 Claims**



1. A thermally powered heat transfer system comprising:

a plurality of compressors, each compressor including a high temperature and a low temperature chamber with movable divider means separating the two chambers;

a higher temperature heat transfer loop for each compressor each high temperature heat transfer loop including a refrigerant, an evaporator, a source of heat for the evaporator, a condenser, a heat sink for the condenser, a high temperature chamber of a compressor and means for controlling flow of the the refrigerant through higher temperature heat transfer loops, the condensers of all the high temperature heat transfer loops, except one being the source of heat for all the higher temperature heat transfer loops except one;

a lower temperature heat transfer loop for each compressor including a refrigerant, an evaporator, a source of heat for the evaporator, a condenser, a heat sink for the condenser, a low temperature chamber of a compressor and means for controlling the flow of the refrigerant of the lower temperature heat transfer loop; and

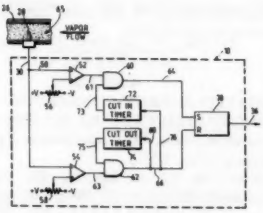
control means for the means for controlling of each loop of the system.

4,537,038

METHOD AND APPARATUS FOR CONTROLLING PRESSURE IN A SINGLE COMPRESSOR REFRIGERATION SYSTEM

Richard H. Alsenz, 2402 Creek Meadow, Missouri City, Tex. 77459, and Roger C. Ansted, 7842 Kendalia, Houston, Tex. 77036

Filed Apr. 30, 1982, Ser. No. 373,626
Int. Cl.³ G05D *23/32*
U.S. Cl. 62—118 **7 Claims**



1. A method of controlling the system refrigerant pressure in a single compressor refrigeration system, comprising the steps of

establishing a selected period functionally related to the compressor on-off cycle,

establishing an operating suction pressure range, detecting the suction pressure in the system for determining when upper and lower limits of said operating pressure range have been exceeded,

applying a compressor turn-on signal to the compressor in response to exceeding said upper limit of said operating pressure range,

operating the compressor in the system in response to applying said turn-on signal,

determining when said lower limit of said operating pressure range has been exceeded for generating a compressor turn-off signal, and

preventing the application of said turn-off signal to the compressor only if said established selected period has not elapsed

---

4,537,039

VAPOR COMPRESSION DISTILLING AND SALT CONCENTRATING DEVICE

Robert E. Fearon, 5246 S. 76th East Ave., Tulsa, Okla. 74145

Filed Jun. 6, 1983, Ser. No. 501,164
Int. Cl.³ B01D *3/02*
U.S. Cl. 62—182 **10 Claims**

1. In a vapor compression distilling device including:

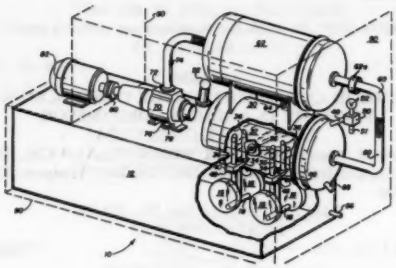
(a) an internal area where the scale will concentrate during operation,

(b) a first chamber adapted to contain the liquid to be distilled,

(c) a compressor means connected to the vapor space above the liquid in said first chamber for withdrawing vapor from the said vapor space in the said first chamber and compressing said vapor, and

(d) a second chamber adapted to receive the compressed vapor from the said compressor such that the compressed vapor is

condensed therein into a liquid condensate derived from said compressed vapor, the improvement comprising a means for



enabling replacement of said area, designed to be plugged into or out of said device.

4,537,040

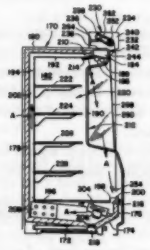
AUTOMATED ENERGY CONSERVING COVER FOR REFRIGERATED CABINET ACCESS OPENINGS

Fayez F. Ibrahim, Niles, Mich., assignor to Tyler Refrigeration Corporation, Niles, Mich.

Division of Ser. No. 256,996, Apr. 24, 1981, Pat. No. 4,424,685. This application Aug. 26, 1983, Ser. No. 526,883

Int. Cl.³ A47F *3/04*

U.S. Cl. 62—186 **7 Claims**



1. Apparatus for automatically covering and uncovering the access of opening of a refrigerated display cabinet having outer walls defining a products storage and display space containing refrigerated air and having an access opening in at least one wall thereof to provide for product access comprising:

elongated housing means, including a first wall and end walls, said first wall defining an opening in said housing between said end walls;

take-up reel means rotatably mounted in said housing means between said end walls of said housing means;

flexible cover means extendable through said opening in said first wall of said housing means, said cover means having a first end portion and a second end portion, said first end portion being attached to said reel means and said cover means being positionable on said reel means between a reeled up position in which said cover means is rolled onto said reel means for storage and a reeled out position in which said access opening in said display cabinet is covered by said cover means;

sensing means for monitoring the occurrence of selected operational input conditions associated with the operation of said refrigerated display cabinet;

means for positioning said flexible cover means by causing the rotation of said reel means, said positioning means being disposed inside said housing means; and

control means, operable in response to said sensing means, for automatically actuating said means for positioning said flexible cover means in the absence of operating personnel whereby contact of ambient air with refrigerated air contained within said product storage and display space is automatically limited when said flexible cover means is in said reeled-out position.

4,537,041

REFRIGERATOR HAVING TEMPERATURE-RESPONSIVE CONTROL MEANS FOR COMBINED DIRECT AND FAN-COOLED OPERATION

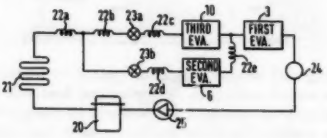
Kazuo Denpou; Kazumi Eto, both of Ibaraki, and Hideo Niida, Takatsuki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 6, 1984, Ser. No. 597,751

Claims priority, application Japan, Jun. 22, 1983, 58-112342

Int. Cl.³ F25B *5/00*; F25D *21/06*

U.S. Cl. 62—199 **16 Claims**



1. A refrigerator having a freezing chamber and a cold chamber comprising:

a main cooling means, including a first evaporator and a fan, for cooling the freezing chamber;

a secondary cooling means, including a second evaporator positioned adjacent said freezing chamber for direct cooling thereof;

a third cooling means, including a third evaporator disposed in said cold chamber for cooling thereof;

a compressor for providing gas coolant for the first, second and third evaporators;

a first control valve for directing gas coolant to the third and first evaporators;

a second control valve for directing gas coolant to the second and first evaporators;

first means for detecting the temperature of the freezing chamber and for controlling the compressor according to the detected temperature thereof; and

second means for detecting the temperature of the cold chamber and for controlling the first and second control valves in accordance therewith.

4,537,042

AUTOMOTIVE REFRIGERATION SYSTEM

Yasuyuki Nishi; Masao Sakurai, both of Oobu, and Masashi Takagi, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Division of Ser. No. 372,380, Apr. 27, 1982, Pat. No. 4,480,443. This application May 8, 1984, Ser. No. 608,276

Int. Cl.³ F25B *27/00*

U.S. Cl. 62—208 **4 Claims**

1. An automotive refrigeration system comprising:

a variable capacity refrigerant compressor adapted to be driven by an automotive engine and including means for varying the displacement of said compressor;

means for driving said compressor displacement varying means so as to controllably vary the displacement of said compressor;

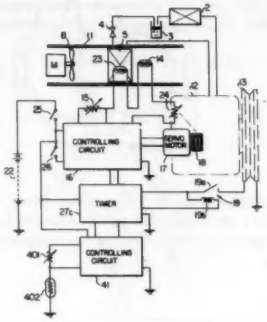
clutch means for drivingly connecting and disconnecting said compressor respectively to and from said engine;

an evaporator disposed in fluid-flow communication with the intake side of said compressor;

sensor means for detecting a condition related to the cooling

operation of said evaporator and for emitting a signal representing the detected condition; and

electric circuit means, responsive to the signal from said sensor means, for actuating said driving means so as to controllably vary the displacement of said compressor and for controlling the operation of said clutch means;



said electric circuit means including means for assuring that said compressor displacement varying means places said compressor in a small compressor displacement position each time, during engine operation, said clutch means is put into operation to drivingly connect said compressor to said engine.

4,537,043

PROCEDURE FOR CREATING AN INERT GAS ATMOSPHERE WITH CONSTANT COMPOSITION OF NITROGEN AND CARBON DIOXIDE IN A REFRIGERATED CONTAINER

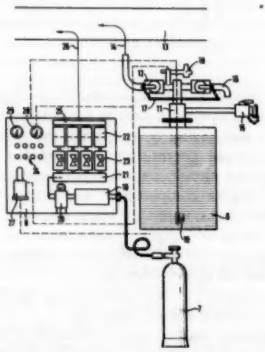
Wolfgang Volker, Tönisvorst, and Hendrik Glastra, Enschede, both of Fed. Rep. of Germany, assignors to Messer Griesheim GmbH, Fed. Rep. of Germany

Filed May 21, 1984, Ser. No. 612,583

Claims priority, application Fed. Rep. of Germany, May 27, 1983, 3319249

Int. Cl.³ B60H *3/04*

U.S. Cl. 62—239 **9 Claims**



1. In a process for creating an inert gas atmosphere having a constant composition of nitrogen and carbon dioxide in a refrigerated container equipped with an engine and a refrigerator, the atmosphere having a low oxygen content which is maintained by means of an oxygen limit value control, the nitrogen being led into the interior of the refrigerated container from at least one storage tank for liquid nitrogen which is connected with the refrigerated container, the carbon dioxide being led into the interior off the refrigerated container from at least one gas bottle which is connected with the refrigerated container, the nitrogen and carbon dioxide being supplied when the predetermined oxygen limit value is exceeded; the improvement being that while the inert gases are being supplied, a constant flow of cold, gaseous nitrogen is produced by means of an electrical evaporator located in the storage tank for liquid nitrogen and connected to the generator of the engine, simultaneously with the production of the gaseous nitrogen also removing carbon dioxide from the gas bottle, and heating and releasing the carbon dioxide at a constant pressure and feeding the carbon dioxide into the refrigerated container via at least one throttle point from a parallel-switched group of such throttle points which can be individually activated.

4,537,044

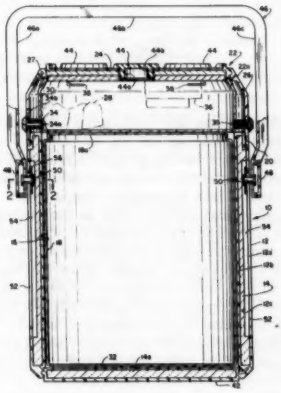
FOOD STORAGE CONTAINER

David Putnam, Mohawk St. and Keystone Ave., Sayre, Pa. 18840

Filed Jan. 11, 1985, Ser. No. 690,778

Int. Cl.³ F25D *3/08*

U.S. Cl. 62—371 **5 Claims**

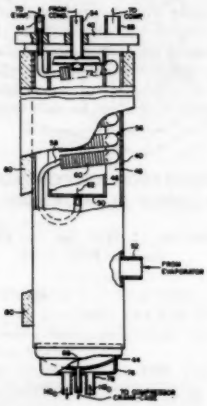


1. In a food storage container of the type having a main housing bounding a food storage compartment and means for selectively providing an input either of heat or cold to the food contents therein, the improvements to said container comprising an auxiliary housing formed on one end of said main housing bounding an operative compartment in adjacent heat and cold transferring relation to said food storage compartment, a first lid for an opening into said auxiliary housing operative compartment for selectively inserting thereinto a source of heat or cold, a second lid for an opening into said food storage compartment from the end opposite from said auxiliary housing for selectively inserting thereinto food contents requiring an input of heat or cold, and a handle movable into first and second container-carrying positions, said first handle position establishing an orientation of said container in which a cold source is in said auxiliary housing operative compartment and is above said food storage compartment for transferring cold in a descending direction thereto, said second handle position establishing a 180 degree reversal in orientation of said container in which a heat source is in said auxiliary housing operative compartment and is below said food storage compartment for transferring heat in an ascending direction thereto, whereby the efficiency of the transfer to said food contents of either heat or cold is enhanced by the container orientation and the direction of said transfer.

4,537,045
COMBINATION REFRIGERANT RECEIVER, ACCUMULATOR AND HEAT EXCHANGER

Donald K. Mayer, Bloomington, Minn., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 7, 1984, Ser. No. 679,512
Int. Cl.³ F25B *43/00*
U.S. Cl. 62—503 **8 Claims**



1. For a refrigeration unit including a refrigerant compressor, a refrigerant condenser having an inlet and outlet, and a refrigerant evaporator having an inlet and outlet, a combined liquid refrigerant receiver, refrigerant suction gas accumulator, and refrigerant heat exchanger, comprising:

an outer cylindrical shell serving as the accumulator and having a refrigerant gas inlet and a refrigerant gas outlet;

an inner cylindrical casing, concentrically disposed within said shell to provide an annular space therebetween, and serving as the liquid refrigerant receiver, said receiver having an inlet connected to said condenser outlet, and an outlet located internally of said shell; and

a heat exchanger located in said annular space and having an inlet connected to said receiver outlet and an outlet in communication with said evaporator inlet.

4,537,046
SEMI-CLOSED TYPE REFRIGERANT COMPRESSING MACHINE

Shigeo Fujiyama, and Yasuhiro Ogata, both of Nagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 29, 1984, Ser. No. 625,894
Claims priority, application Japan, Jul. 1, 1983, 58-120612
Int. Cl.³ F25B *31/00*
U.S. Cl. 62—505 **4 Claims**

1. A semi-closed type refrigerant compressing machine comprising:

(a) a casing provided with a refrigerant gas intake port;

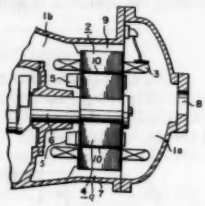
(b) a compressor shaft mounted in said casing and projecting towards said refrigerant gas intake port;

(c) a rotor mounted on said compressor shaft;

(d) a stator bearing a stator winding mounted in said casing and surrounding said rotor so as to leave an air gap therebetween, said rotor and said stator being mounted between the inlet side and the outlet side of a motor chamber, the inlet side of said motor chamber being in fluid communication with said refrigerant gas intake port; and

(e) a plurality of refrigerant gas passages leading from the inlet side of the motor chamber to the outlet side of the motor chamber radially outwardly of said stator,

(f) said rotor having a plurality of vanes formed on the outlet side thereof to direct refrigerant gas over the stator winding on the outlet side of said stator but no vanes formed on the inlet side thereof to direct refrigerant gas over the

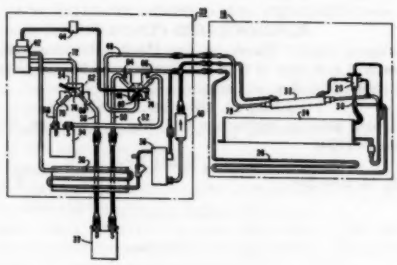


stator winding on the inlet side of said stator, whereby the temperature on said outlet side is lowered by said vanes without unnecessarily lowering the temperature on said inlet side.

4,537,047
TRUCK TRANSPORT REFRIGERATION UNIT

Jayaram Seshadri, and Daniel T. Neimy, both of Minneapolis, Minn., assignors to Thermo King Corporation, Minneapolis, Minn.

Filed Mar. 2, 1984, Ser. No. 585,683
Int. Cl.³ F25B *1/10*
U.S. Cl. 62—510 **4 Claims**



1. For a transport refrigeration unit of the type adapted for temperature conditioning a load in a truck having an engine compartment, and having two separate, mutually exclusively operable refrigerant compressors connected to a common refrigerant system circuit, one of said compressors being located in said engine compartment and driven by the truck engine and the other compressor being electrically driven and located away from said engine compartment, an arrangement for preventing undue oil and refrigerant exchange between one compressor and the other, wherein:

both said compressors are substantially identical with respect to pumping and oil capacity;

each compressor suction line is connected to a separate check valve to a first fitting connected to the refrigerant system suction line;

each compressor discharge line is connected to a separate check valve to a second fitting connected to the refrigerant system pressure line; and

said refrigerant system suction line is connected to the physical bottom side of said first fitting and said check valves are physically located above said first fitting.

4,537,048

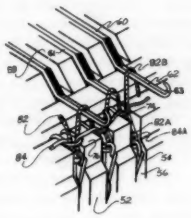
PILE LOOP FORMING AND CUTTING ELEMENTS FOR CIRCULAR KNITTING MACHINES

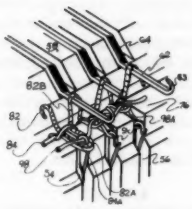
Alan Gutschmit, Troy, and Paul W. York, Asheboro, both of N.C., assignors to Monarch Knitting Machinery Corp., Glendale, N.Y. and Monatex S.A., Neuchatel, Switzerland

Division of Ser. No. 213,872, Dec. 8, 1980, Pat. No. 4,409,800, which is a continuation-in-part of Ser. No. 905,021, May 11, 1978, abandoned. This application Jul. 21, 1983, Ser. No. 515,690

Int. Cl.³ D04B *35/02, 9/12*

U.S. Cl. 66—93 **6 Claims**





5. A movable one-piece pile loop forming and cutting element comprising a lengthwise extending body member having an open sided yarn engaging hook at an end thereof, having a yarn cutting edge spaced from and facing the open side of said hook, and having a yarn supporting surface extending lengthwise therebetween for drawing of an uncut loop of pile yarn over and for supporting of said loop on said surfaces, said element being movable to three positions relative to said yarn thereto, said positions including a middle position wherein said yarn is drawn into said pile yarn loop over and is supported on said surface, one position moved longitudinally in one direction from said middle position wherein said hook engages, distends and retains said pile yarn loop, and another position moved longitudinally in the opposite direction from said middle position wherein said cutting edge severs said pile yarn loop to free said element of said loop and to provide cut pile ends of said yarn.

4,537,049

CONTROL CIRCUIT FOR LOCKING MECHANISM OF VEHICLE DOOR

Peter J. Lupoli, Hamden, Conn., assignor to Sun Chemical Corporation, New York, N.Y.

Filed Mar. 21, 1983, Ser. No. 477,319

Int. Cl.³ E05B *47/00*

U.S. Cl. 70—277 **25 Claims**

1. An electric-powered door lock system for a door movable between open and closed positions in a van or other vehicle, comprising in combination:

(a) a manually operable locking member,

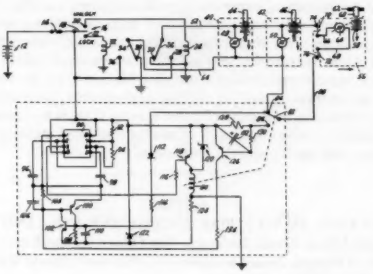
(b) cooperable locking means on the vehicle body and door, to enable the latter to be locked in its closed position,

(c) an electrically powered mechanism carried by said door for operating the locking means,

(d) a pair of cooperable electrical contacts on said door and vehicle body respectively, adapted to engage one another only when the door is in its closed position,

(e) said electrical contact on the door being adapted to transmit power to said mechanism,

(f) power means for applying an intermittent voltage to said



vehicle body contact, said power means being capable of operating said electrically powered mechanism and being rendered operable in response to actuation of said manually operable locking member, and

(g) automatically actuated disabling means controlling said power means and responsive to engagement of said cooperable contacts, for automatically rendering inactive the power means only after said electrically powered mechanism has at least once been activated to lock the door.

4,537,050

METHOD OF CONTROLLING A STAND FOR ROLLING STRIP MATERIAL

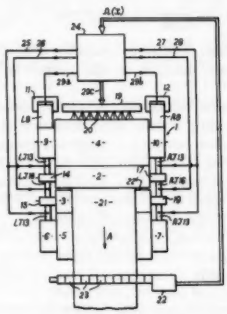
Greyham F. Bryant, Southall; Peter D. Spooner, Middlesex, and William K. J. Pearson, Amersham, all of England, assignors to The British Aluminium Company plc, London, England

Continuation of Ser. No. 453,860, Dec. 20, 1982, abandoned. This application Nov. 8, 1984, Ser. No. 669,445

Claims priority, application United Kingdom, Apr. 25, 1981, 8112816; PCT Int'l Appl., Apr. 23, 1982, PCT/GB82/00120

Int. Cl.³ B21B *37/06, 37/12, 27/06*

U.S. Cl. 72—8 **12 Claims**



1. A method of controlling one stand of a mill for rolling strip material, the mill having upper and lower back-up rolls and a pair of work rolls disposed between the back-up rolls, first and second screw means for respectively controlling movement of the ends of one of the back-up rolls and first and second jack means for respectively applying forces to each of the ends of the work rolls and a shape sensor having outputs

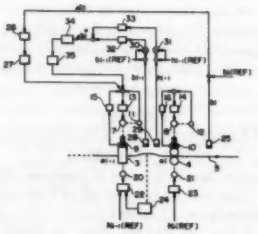
from which the stress distribution across the width of the rolled strip is determined, comprising determining the effect upon the shape of the strip of the joint operation of the screw means and the joint operation of the jack means and deriving two mathematical expressions, respectively, representative of such operations, determining the difference between said stress distribution and a desired stress distribution and obtaining a correction of stress distribution characterised by separately determining the effect upon the shape of the strip of the operation of each screw means and each jack means and deriving four mathematical expressions each including a control parameter respectively representative of such operations, determining a single error distribution E (x) as the difference between said stress distribution and a desired stress distribution, obtaining a single correction of stress distribution C (x) by determining an optimum value for each of said control parameters such that a function of the distribution E (x) – C (x) is minimized and separately controlling each of said screws and jacks in accordance with said control parameters.

4,537,051

CONTROL DEVICE FOR SUCCESSIVE ROLLING MILL

Shuhei Niino; Koichi Ishimura; Ken Okamoto, and Koichi Ohba, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 29, 1982, Ser. No. 427,340
Claims priority, application Japan, Sep. 30, 1981, 56-157211
Int. Cl.³ B21B *37/02, 37/12*
U.S. Cl. 72—12 **4 Claims**



1. A control device for a successive rolling mill having alternating vertical and horizontal roll stands for rolling a material in the width and height directions, respectively, comprising:

an (i-1)-th vertical roll stand and an i-th horizontal roll stand for screwing down on a material through the roll gaps of the stands;

first dimension detecting means for detecting a dimension of said rolling material at the output side of said (i-1)-th stand;

first dimension deviation computing means for computing and providing a dimension deviation factor indicative of the deviation between a reference dimension of said rolling material at the output side of said (i-1)-th stand and the detected dimension from said dimension detecting means, said deviation factor representing the deviation as a percentage of the reference dimension;

forecasting means, responsive to said deviation factor, for providing a forecast output representing a forecast change in the width dimension of said rolling material at the output side of said i-th roll stand;

width dimension detecting means for detecting and providing the actual width dimension of said rolling material at the output side of said i-th stand;

width dimension deviation computing means for computing and providing as an output the deviation between the actual width dimension provided by said width dimension detecting means and a reference width dimension; and

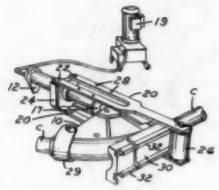
screw control means for controlling the screwing down of the roll gap in said (i-1)-th stand in accordance with the forecast output of said forecasting means and the output of said width dimension deviation computing means so that said deviation of the actual width dimension at the output side of said i-th stand is zeroed.

4,537,052

FOLLOW BAR WITH CAM TRACKS FOR ROCKER TYPE CONDUIT BENDER

Larry G. Adleman, 1307 E. Gate Parkway, Rockford, Ill. 61108

Filed Jul. 13, 1984, Ser. No. 630,912
Int. Cl.³ B21D *7/04*
U.S. Cl. 72—154 **5 Claims**



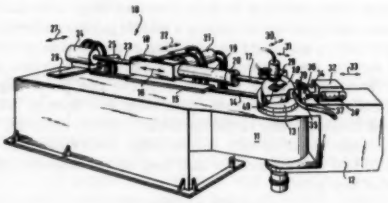
2. In a rocker type conduit or tube bender having a shoe wherein a bending force is transmitted through an axis thereon offset from the axis of shoe rotation by a lever arm distance which varies during bending and having a follow bar movable with rotation of the shoe with the conduit therebetween, the improvement comprising cam means provided on the follow bar and configured to effect changes in bending force on the conduit in inverse relation to changes in lever arm distance to enhance uniformity of bending forces on the conduit during rotation of the shoe and consequent bending of the conduit or tube.

4,537,053

PIPE BENDING MACHINE

Rigobert Schwarze, Olpener Str. 460-474, 5000 Köln 91, Fed. Rep. of Germany

Filed Nov. 17, 1982, Ser. No. 442,444
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1981, 3149557
Int. Cl.³ B21D *7/04*
U.S. Cl. 72—157 **26 Claims**



1. A pipe bending machine comprising means defining a feed path;

pipe holding and feeding means operative to hold a pipe to be bent and movable to feed said pipe along said feed path;

a slidable guide member extending in the longitudinal direction of said feed path for guidance of said pipe;

a feed table mounted for pivotation about an axis;

a bending template shiftably mounted on said table to be movable therewith and comprising means defining two curved bending surfaces disposed one at each of two substantially opposite sides of said template and in a single plane for selective bending there-around of said pipe on pivotation of said table with said template, said two

curved bending surfaces being of respectively different radii;

clamping means movable with said template and co-operable with said template for clamping of said pipe selectively to said curved bending surfaces in dependence on the radius of a bend to be formed in said pipe;

displacing means operatively connected with said template and operable to displace said template during the bending of the pipe in a horizontal plane and relative to said longitudinal direction of said feed path to compensate for any eccentricity of the center of curvature of either or each of said curved bending surfaces with respect to said axis of pivotation of said bending table; and

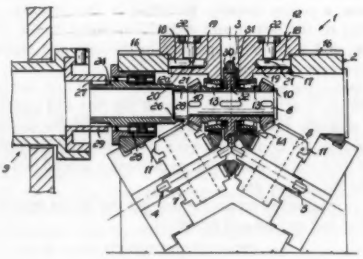
wherein said displacing means is arranged coaxially with said axis of pivotation of said bending table and is adapted to so control the position of said template on said bending table as to maintain a constant spacing between said axis of pivotation and a point of tangency of said slidable guide member with said template during bending of said pipe around either one of said curved bending surfaces, said spacing being equal to the length of a smaller one of said radii, whereby during bending of the pipe around the curved bending surface of smaller radius the position of said template on said bending table remains unchanged whereas in bending the pipe around the curved bending surface of the larger radius said displacing means continuously urges said template against said slidable guide member.

4,537,054

ROLLING UNIT FOR A BAR OR THE LIKE ROLLING MILL

Giulio Properzi, Via Pietro Cossa 1, Milano, Italy

Filed May 26, 1983, Ser. No. 498,406
Claims priority, application Italy, Jun. 18, 1982, 21935 A/82
Int. Cl.³ B21B *13/10*
U.S. Cl. 72—224 **3 Claims**



1. A rolling unit for a bar or the like rolling mill comprising:

a support casing,

mill rollers having axes arranged at 120° from one another and including a main drive roller having a shaft, supports and bearings for said rollers and seals for isolating an oil circuit from an emulsion circuit; said mill rollers with respective supports, and said bearings and seals being contained in said support casing;

a body removably positionable on the unit casing and carrying the main drive roller; said body being removably positionable in a direction radial to said main drive roller and being adjustable on said casing, at least in the direction of the axis of said main roller;

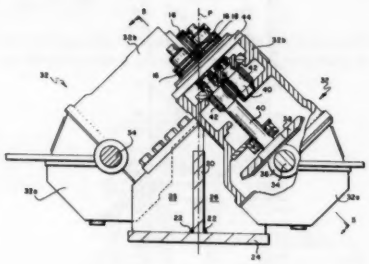
a coupling shaft driven by a drive and having dog clutch means on at least one end thereof; said shaft of said main drive roller having an end thereof with other dog clutch means for mutual rotatory engagement, but in an axially slidable way, with said dog clutch means of said coupling shaft.

4,537,055

SINGLE STRAND BLOCK-TYPE ROLLING MILL

Harold E. Woodrow, Northboro, and Raymond L. Smola, Holden, both of Mass., assignors to Morgan Construction Company, Worcester, Mass.

Filed Jun. 20, 1984, Ser. No. 622,543
Int. Cl.³ B21B *35/02*
U.S. Cl. 72—235 **8 Claims**



1. A single strand block-type rolling mill having successive pairs of oppositely inclined work rolls arranged to roll products such as bars or rods in a twist-free manner, comprising:

a vertically upstanding structural member joined to an underlying horizontal base plate to form an inverted "T" shaped cross section, said structural member extending beneath and in parallel relationship to the rolling line;

a plurality of rib members extending laterally away from and spaced along said structural member on opposite sides thereof, said rib members being joined on edge to both said structural member and said base plate and having upper support edges;

a plurality of gear housings successively arranged along the rolling line, said gear housings having lower portions alternately arranged on opposite sides of said structural member, each gear housing being carried on and secured to the upper support edges of an adjacent pair of said rib members, said gear housings each containing a line shaft segment with a driving bevel gear which meshes with a driven bevel gear on one of a pair of intermediate drive shafts, said intermediate drive shafts carrying intermeshed gears;

roll packages carried by said gear housings, each roll package having a pair of roll shafts carrying a pair of said work rolls, said roll shafts having gears which mesh with the gears on said intermediate drive shafts;

means for interconnecting the line shaft segments on opposite sides of said structural member; and

primary drive means at one end of said structural member for driving said interconnected line shaft segments.

4,537,056

ROLLING MILL

Joel L. Heffentrager, Mars, Pa., assignor to SMS Schloemann - Siemag, Inc., Pittsburgh, Pa.

Filed Dec. 1, 1983, Ser. No. 557,052
Int. Cl.³ B21B *31/12*
U.S. Cl. 72—238 **12 Claims**

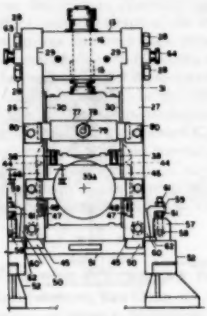
1. A rolling mill comprising:

upper and lower roll assemblies each including a roll having a journal at each of opposite ends thereof received in a bearing chock,

a pair of inverted U-shaped housings each having two housing post sections depending from a top beam section forming a window to receive the bearing chock at one end of each roll for support thereby, each window being open at the bottom of the housing post sections to permit the chocks of at least the lower roll assembly to move into and

out of the windows of the housings, by moving the housings relative to the chocks of the lower roll assembly

load transfer means removably mounted on the lower end portions of said housing post sections for transferring a rolling load from the bearing chocks of said lower roll assembly to the housing post sections, said load transfer



means being movable to a position out of engagement with the bearing chocks for the lower roll assembly to allow the roll assembly to pass from the housing windows beyond the lower ends of the housing post sections, and

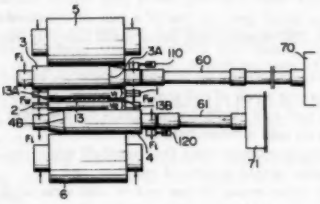
first platform means removably mounting said post sections for supporting said housings with said roll assemblies while in a normally operative position.

4,537,057

METHOD FOR RD ROLLING SHEET METAL

Toshiyuki Kajiwara, and Tatsuji Kojima, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 8, 1983, Ser. No. 473,197
Claims priority, application Japan, Mar. 10, 1982, 57-38802
Int. Cl.³ B21B *29/00, 31/18, 31/20*
U.S. Cl. 72—243 **7 Claims**



1. A method for RD rolling of sheet metal with a mill having a pair of working rolls, at least a pair of back-up rolls, and at least a pair of intermediate rolls, comprising the steps of:

continuously passing sheet metal between the working rolls while maintaining a gap between the working rolls to effect a reduction in sheet metal thickness;

simultaneously tensioning the sheet metal as it passes through the working rolls and driving the working rolls at different peripheral speeds, so that the upper and lower neutral points between the upper and lower work rolls and the sheet metal are displaced relative to each other a controlled amount sufficient to obtain a reduction of the rolling pressure and so that the energy for causing plastic deformation of the sheet metal is given by the difference between the tension applied to the delivery and entrance sides of the sheet metal, all to obtain a controlled RD rolling effect; and

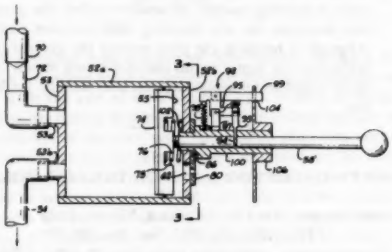
during said reduction of said sheet metal, simultaneously controllably imparting slight edge wave only in each edge portion of the sheet metal, said each edge portion being defined by the area of the strip extending inwardly from the strip edge by a distance of about 0.5 to 2% of the strip width, by controllably axially shifting of the intermediate rolls relative to the sheet metal edges, respectively, and controllably bending the opposite ends of at least one pair of the work rolls and intermediate rolls, sufficiently to correspondingly essentially eliminate tension in the sheet metal edges on the delivery side of the working rolls, so that the reduction ratio and correspondingly delivery side tension may be set desirably high without producing edge cracking and sheet breakage.

4,537,058

VOLUME CALIBRATION SYRINGE

Charles R. Luper, Anaheim, Calif., assignor to Sensormedics Corporation, Anaheim, Calif.

Filed Jul. 6, 1982, Ser. No. 395,171
Int. Cl.³ G01D *18/00;* **G01F** *25/00;* **G01N** *37/00*
U.S. Cl. 73—1 G **24 Claims**



1. In a gas volume calibration syringe of the type including a housing having a central section and first and second end sections, a piston slidably mounted in the housing, a shaft attached to the piston and slidably mounted in the first end section, and a gas inlet aperture in the first end section, the improvement comprising:

(a) means for establishing a predetermined first end position for the piston in the vicinity of the first end section,

(b) separate inlet and outlet openings in the second end section, the contact between one surface of the piston and at least one of said openings defining a second end position for the piston, and

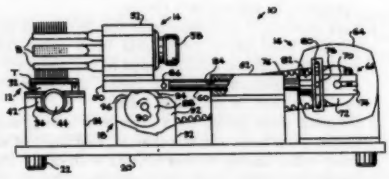
(c) spring-loaded means for driving the piston between said first and second end positions.

4,537,059

AUTOMATIC BRUSHING MACHINE

Paul J. Sokolovsky, Sunnyvale, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Aug. 12, 1983, Ser. No. 522,910
Int. Cl.³ G01N *3/56*
U.S. Cl. 73—7 **7 Claims**



1. A reciprocating-brush testing apparatus comprising:

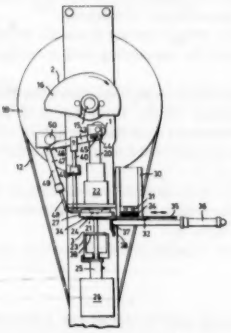
a support platform;
means mounted on the platform for removably supporting a test piece at a fixed location;
a rod reciprocatably mounted on the platform;
a brush holder having a predetermined weight pivotally attached at one end to the rod;
means for reciprocating the rod to translate a brush held by the brush holder along a substantially straight path over the test piece; and
means for periodically elevating the brush holder so that the brush will not contact the test piece during one stroke of the reciprocation cycle, but be lowered onto the test piece during the other stroke of the reciprocation cycle.

4,537,060

APPARATUS AND METHOD FOR MULTIAXIAL IMPACT TESTING OF MATERIALS

John D. Underwood, Wales, United Kingdom, assignor to Monsanto Europe, S.A., Brussels, Belgium

Filed Dec. 19, 1983, Ser. No. 562,921
Claims priority, application United Kingdom, Dec. 23, 1982, 8236587
Int. Cl.³ G01N *3/30*
U.S. Cl. 73—12 **11 Claims**



1. Apparatus for multiaxial impact-testing of a material, comprising an impact member arranged for impact with a sample of the material, wherein either the energy or the force required to rupture the sample in its weakest direction on such impact is employed as a measure of the multiaxial impact strength of the material, characterized in that relative movement of the sample and the member is maintained at a substantially constant velocity along a straight line before and after impact and is derived from angular movement of a cam driven by a flywheel.

4,537,061

ELECTRONIC LEVEL DETECTOR

Roy W. DeMeyer, Oconomowoc, Wis., and Martin F. Kozi, Lombard, Ill., assignors to Magnetrol International, Incorporated, Downers Grove, Ill.

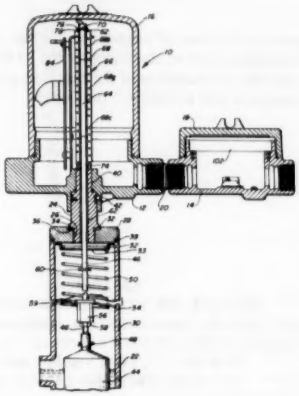
Filed Feb. 4, 1983, Ser. No. 463,712
Int. Cl.³ G01F *23/00*
U.S. Cl. 73—290 R **5 Claims**

1. In a level detector having a movable displacer for following the level of liquid in a tank, a displacer rod coupled to and movable with the displacer and an enclosure tube coupled to the tank for enclosing the displacer rod, the improvement comprising:
a linear variable differential transformer having
a primary winding and two secondary windings disposed about the outside of the displacer rod, and
a ferromagnetic core disposed atop the displacer rod inside the enclosure tube such that the displacer rod moves in response to movement of the displacer with the magnetic coupling between the primary and secondary windings being a function of the position of the core, wherein one of the secondary windings develops a first signal having an amplitude E_1 and the other of the secondary windings develops a second signal having an amplitude E_2 wherein

$$E_1 = kE_a$$

$$E_2 = (1-k)E_a$$

where E_a is the maximum amplitude of the signal from one of the secondary windings when full coupling is present



between the primary winding and that secondary winding and wherein k is a coupling coefficient representing the degree of magnetic coupling between the primary and the secondary windings; and
means for developing an indication of the magnetic coupling between the primary and the secondary coils, and hence the level of the liquid in the tank, wherein the indication developing means includes an oscillator coupled to the primary winding for developing an alternating current signal therein, means for rectifying the first and second signals to develop DC signals having amplitudes proportional to E_1 and E_2, respectively, and a difference amplifier for subtracting E_1 from E_2 to generate a difference signal representative of the level of the liquid in the tank.

4,537,062

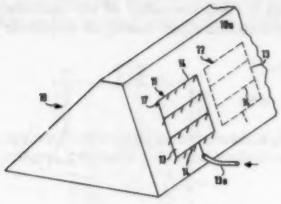
METHOD AND APPARATUS FOR INVESTIGATING THE STRUCTURE AND POROSITY OF EARTH AND STONY REGIONS

Werner Ernst, Tübingen, Fed. Rep. of Germany, assignor to Kohlensaure-Werke Rudolf Buse Sohn GmbH & Co., Bad Honningen, Fed. Rep. of Germany

Filed Oct. 19, 1983, Ser. No. 543,434
Claims priority, application European Pat. Off., Oct. 19, 1982, 82109653.4
Int. Cl.³ G01N *15/08*
U.S. Cl. 73—38 **6 Claims**

1. The non-destructive method of investigating the structure, dampness, and porosity of soil and stony bodies over substantially large areas such as that effecting the percolation of water in areas about dams, comprising the steps of,
introducing a measuring gas under slight pressurization at an injection site in the locality being investigated to penetrate the soil and flow outwardly from the injection site as a function of the porosity and dampness of the soil,
recapturing and measuring the gas at several measuring sites

remote from the injection site after penetration into said bodies, and



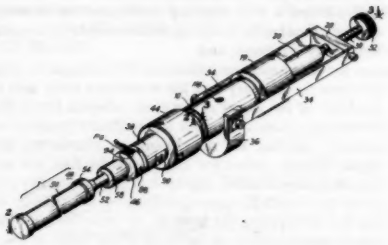
measuring the time of penetration through the bodies under investigation from the injection site to the measuring site and the concentration of the resulting gas to establish the dampness and porosity of the bodies.

4,537,063

NONSTEADY-STATE CORE HOLDER

Harold T. Barnaby, Duncanville, Tex., assignor to Core Laboratories, Inc., Dallas, Tex.

Filed May 17, 1984, Ser. No. 611,101
Int. Cl.[3] G01N *15/08*
U.S. Cl. 73—38 **9 Claims**



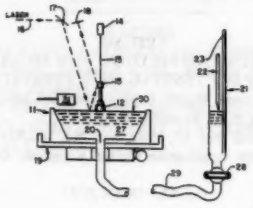
1. Core holder apparatus for nonsteady-state measurement of flow characteristics of a geological core sample, comprising a barrel having a core chamber therein open at its ends for holding said core sample for passage of a gaseous test medium therethrough from an upstream end to a downstream end; retaining means within said barrel for retaining said core sample in said core chamber; reference pressure reservoir means for containing a predetermined volume of said gaseous test medium under a predetermined pressure, said volume to pass from said reservoir means to the upstream end of said core sample and thence therethrough and out the downstream end thereof to a lower pressure drain for said test medium; gas operated valve means coupling said reservoir means to the upstream end of said core chamber and rapidly opening for rapidly exposing the upstream end of said core sample to the gaseous test medium in said reservoir when a control gas pressure is applied to an opening actuator port of said valve means; and pressure monitoring means coupled to said reference pressure reservoir means for measuring the pressure therein decaying over time as said gaseous test medium flows therefrom through said core sample.

4,537,064

METHOD AND APPARATUS FOR MEASURING SHEAR MODULUS AND VISCOSITY OF A MONOMOLECULAR FILM

Bernard M. Abraham, Oak Park, Ill.; Kenjiro Miyano, Sendai, Japan, and John B. Ketterson, Evanston, Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 18, 1983, Ser. No. 542,957
Int. Cl.[3] G01N *11/16, 13/02*
U.S. Cl. 73—54 **15 Claims**



1. Apparatus for measuring the shear modulus of a monomolecular film (monolayer) comprising:

(a) a circular trough having inwardly sloping sides, containing a liquid for supporting said monolayer on the surface thereof;

(b) a circular rotor suspended above the trough such that the lower surface of the rotor contacts the surface of the liquid, positioned such that the axis of the rotor is concentric with the axis of the trough, and freely rotable about its axis;

(c) means for hydrostatically compressing said monolayer in the annular region formed between the rotor and the sides of the trough; and

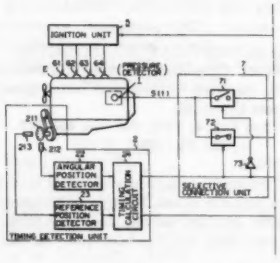
(d) means for rotating the trough about its axis.

4,537,065

DEVICE FOR DETECTION OF ABNORMALITY IN PRESSURE DETECTOR FOR INTERNAL COMBUSTION ENGINE

Yoshinori Ootsuka; Tadashi Hattori; Minoru Yamamoto, all of Okazaki, and Tadashi Ozaki, Gamagori, all of Japan, assignors to Nippon Soken, Inc., Nishio and Nippondenso Co., Ltd., Kariya, both of, Japan

Filed Feb. 1, 1984, Ser. No. 575,996
Claims priority, application Japan, Feb. 3, 1983, 58-15519
Int. Cl.[3] G01M *15/00*
U.S. Cl. 73—117.3 **8 Claims**



1. A device for detecting an abnormality in a pressure detector in an internal combustion engine comprising:

a piezoelectric type pressure detector;

a timing detection means having an angular position detector,

a reference position detector, and a timing calculation circuit for calculating the timing;

a selective connection means for carrying out the selective connection of the output terminal of said pressure detector; and

an abnormality detection means for receiving the output of said timing detection means and one of the outputs of said selective connection means,

said abnormality detection means including a capacitor connected in series to an oscillation circuit,

said pressure detector being connected in parallel with the series connection of said oscillation circuit and said capacitor.

4,537,066
AEROENGINE TEST CELLS

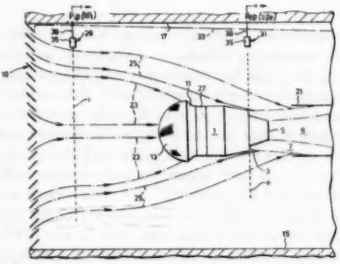
Philip A. Simpson, Nottingham, England, assignor to Rolls-Royce Limited, London, England

Filed Oct. 12, 1983, Ser. No. 541,314

Claims priority, application United Kingdom, Nov. 10, 1982, 8232151

Int. Cl.³ G01M *15/00*

U.S. Cl. 73—117.4 **8 Claims**



1. A method of correcting thrust measurements in an aeroengine test cell in respect of an aeroengine installed for testing therein, said aeroengine having an air-washed external surface with an upstream end and a downstream end with respect to airflow thereover, and said testing of said aeroengine involving the correction of net thrust measurements X_B to gross thrust measurements X by means of a thrust correction D representing the drag due to air-flows into said aeroengine, over said air-washed external surface of said aeroengine, and through said test cell, where $X_B = X - D$, said test cell having;

air inlet means for allowing air to enter said test cell to supply said aeroengine,

exhaust means whereby efflux from said aeroengine plus air entrained into said efflux from within said test cell is exhausted from said test cell, and

thrust balance means for measuring said net thrust X_B of said aeroengine in said test cell: said method comprising;

obtaining, during testing of said engine, a measure of static pressume p_i at an "inlet" location i in said test cell, and a measure of static pressure p_e at an "exit" location e in said test cell, said location i being downstream of said air inlet means and upstream of said aeroengine and said location e being spaced outwardly from, but in substantial registration with, said downstream end of said air-washed external surface of said aeroengine, and

calculating the value of D by utilising said measures of p_i and p_e in a function of the form $D = f(p_i, p_e)$

4,537,067
INERTIAL BOREHOLE SURVEY SYSTEM

Harper E. Sharp, Houston, Tex.; Leo Spiegel, Sharon, Mass.; Richard M. Masters; Elmer J. Frey, both of Lexington, Mass.; John R. Howatt, Bedford, Mass., and Gary E. Walker, Dover, Mass., assignors to Wilson Industries, Inc., Houston, Tex.

Division of Ser. No. 442,849, Nov. 18, 1982, abandoned. This application Nov. 9, 1983, Ser. No. 535,281

Int. Cl.³ E21B *47/00*

U.S. Cl. 73—151 **38 Claims**

1. A probe for insertion in a borehole for making measurements therein comprising:

an elongated outer housing forming a pressure vessel;

a temperature sensitive instrument means disposed in said housing;

a thermal insulating member disposed in said housing and defining a chamber in which said instrument means is disposed, said member forming a thermal barrier between said housing and said instrument means; and

isothermal heat absorbing means disposed in said housing and in heat flow receiving communication with said instrument means, said heat absorbing means including a quantity of material for absorbing heat in said chamber, said material being adapted to undergo a phase change at a phase change temperature which will maintain said instrument means in a predetermined temperature range for a predetermined time period, said phase change temperature being substantially above most ambient temperatures wherein an ambient temperature fluid may be utilized to cool said material to a temperature below said phase change temperature.

4,537,068
THERMAL ANEMOMETER

Stanley A. Wrobel, Harbert, and Robert G. Ashton, Watervliet, both of Mich., assignors to Dwyer Instruments, Inc., Michigan City, Ind.

Filed Mar. 10, 1983, Ser. No. 474,043

Int. Cl.³ G01F *1/68*

U.S. Cl. 73—202 **7 Claims**

1. A thermal anemometer for measuring the velocity of an air stream, and comprising:

a probe having mounted in same in spaced relation a thermistor and a solid state linear output temperature sensor,

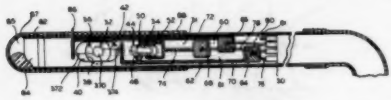
said probe being ported transversely across same at said thermistor and said sensor, respectively, for passage of the air flow therethrough about said thermistor and said sensor,

a source of electrical energy,

means for electrically operating said thermistor in a self

heated mode at a constant predetermined temperature from said energy source to provide a thermistor signal in proportion to the velocity and the difference in temperature between that of the thermistor and the ambient temperature of the air stream,

means for operating said sensor from said energy source to provide a sensor signal in proportion to the ambient temperature of the air stream,



means for electronically combining said signals to provide a resultant signal that is in proportion to the velocity of the air stream free of effect of the ambient temperature variation of said signal of said thermistor, and

means for reading out said resultant signal,

said sensor comprising a transistor having a constant current flow through its base emitter junction to provide said sensor signal.

4,537,069

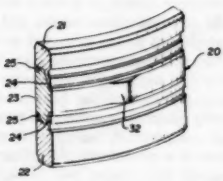
DEVICE AND METHOD TO ENABLE DETECTION AND MEASUREMENT OF DEFORMITIES IN WELL COMPONENTS

John H. Mayo, 404 Alonda Dr., Lafayette, La. 70503

Filed Jun. 12, 1984, Ser. No. 619,828

Int. Cl.³ G01B *5/28, 21/30*

U.S. Cl. 73—432 R **2 Claims**



1. A device for detecting the existence and magnitude of wear-induced recesses in the bores of tubular well components comprising a body portion adapted to be positioned in a well adjacent to a tubular component of the well and within the bore of such component, an axially narrow ring element on and surrounding the body portion and being formed entirely of a non-elastic compliant and formable material, a pair of rigid containment rings for the ring element of compliant and formable material on and surrounding the body portion on opposite sides of said ring element coaxially therewith, said containment rings being recessed in their opposing end faces to receive and hold end portions of the ring element, the compliant and formable ring element having its exterior circumferential face freely disposed and unobstructed between said rigid containment rings, and means on the body portion to exert axial forces on the containment rings in opposite directions and causing compression and radial expansion of the compliant and formable ring element whereby the latter will enter any existing wear-induced recess in the bore of the adjacent tubular component of the well to indicate the existence and magnitude of such wear-induced recess following withdrawal of the body portion from the well.

4,537,070

MAGNETICALLY RESPONSIVE CIRCUIT-ELEMENT MODULE FOR LIQUID-LEVEL MONITORING AND PROBE THEREFROM

William P. Milish, Bristol, Conn., assignor to Transamerica Delaval Inc., Princeton, N.J.

Filed Aug. 26, 1983, Ser. No. 526,878

Int. Cl.³ G01F *23/12;* **H01H** *35/18*

U.S. Cl. 73—313 **20 Claims**

1. A magnetically responsive circuit-element module for liquid-level monitoring apparatus comprising an elongated body having ends that are complementally shaped and keyed for interlocking end-to-end assembly with other modules having the same end construction to form an assembly of any desired length, at least one float-magnet actuatable magnetic reed switch confined within said body, and electrically conductive members that are accessible from outside said body and that extend into the interior of said body where said conductive members are coupled to said reed switch for establishing electrical connection to said reed switch, said conductive members having portions located and oriented with respect to said body such that upon effecting said interlocking end-to-end assembly with other modules said conductive member portions are positioned for coupling to complemental conductive members that extend into said other modules to establish a network of reed switches connected electrically in a liquid-level sensing circuit.

4,537,071

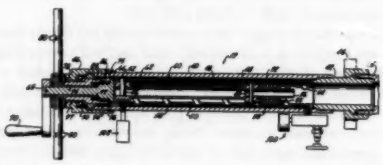
RETRIEVER TOOL

David K. Waterman, Placentia, Calif., assignor to Rohrback Corporation, Seattle, Wash.

Filed Nov. 23, 1983, Ser. No. 554,317

Int. Cl.³ G01D *21/00*

U.S. Cl. 73—432 R **27 Claims**



1. A tool for retrieving a device holder from and inserting it into a vessel having an access fitting and an access valve connected with the fitting, said tool comprising

an elongated tool housing,

a transport shaft mounted in said housing for translational and rotational motion,

connector means carried by said shaft for detachably securing a device holder to said shaft,

translation drive means for axially driving said shaft between an extended position in which the shaft and connector means project forwardly of said housing so as to extend through said access valve and said access fitting and a retracted position in which the shaft is withdrawn into said housing, said drive means including an end portion that overlaps at least a portion of said connector means within said housing when said shaft is in said retracted position, and

rotation drive means for rotating said shaft.

4,537,072

ARRANGEMENT FOR EXCHANGING MEASURING AND/OR SAMPLING PROBES

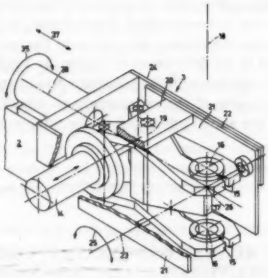
Johann Fohler, Puchenau, Austria, assignor to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Dec. 1, 1983, Ser. No. 557,356

Claims priority, application Austria, Dec. 9, 1982, 4474/82

Int. Cl.³ F27D *21/00*; G01N *33/20*

U.S. Cl. 73—432 R **8 Claims**



1. In an arrangement for exchanging measuring and/or sampling probes, which probes are slippable onto holding means on the lower end of a verticaly movable lance for frictional engagement therewith, said arrangement including a grab adapted to clamp said probes and movable between an operation position below said lance and a position laterally displaced therefrom, the improvement comprising

an arm movable laterally towards and away from said operation position, and

universal joint means securing said grab to said arm and enabling said grab automatically to align a probe clamped thereby with the holding rod on said lance.

4,537,073

INSPECTION METHOD OF SQUARE BILLET USING ELECTRONIC SCANNING

Takehiko Ooshiro, Kobe; Masayoshi Iwasaki, Hyogo; Kousuke Sahara, Kobe; Norio Suzuki, Kobe; Hitoshi Utsumi, Kobe; Kazuo Miyake, Kobe, and Kenji Aburatani, Kobe, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Dec. 21, 1983, Ser. No. 563,953

Claims priority, application Japan, Dec. 24, 1982, 57-233944; Feb. 14, 1983, 58-23527

Int. Cl.³ G01N *29/04*

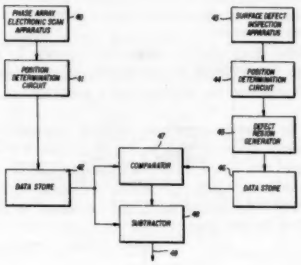
U.S. Cl. 73—602 **4 Claims**

1. A method of detecting subsurface defects in a specimen by ultrasonic inspection, comprising the steps of:

detecting both internal and surface defects by an angle beam inspection on the surface layer of said specimen using a phased array probe;

determining the projection on the surface of the estimated position of a said defect located by said angle beam inspection utilizing the positional relation of said probe and said specimen, the incident angle of the ultrasonic beam, and the defect echo detecting time;

detecting surface defects only using a surface defect inspection apparatus;



determining a defect region for each surface defect detected by said surface defect inspection apparatus;

comparing said estimated defect position information with said defect regions to determine surface defect position information; and

detecting only subsurface defects by subtracting said surface defect region information from said estimated defect position information.

4,537,074

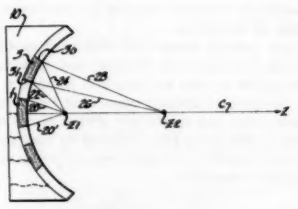
ANNULAR ARRAY ULTRASONIC TRANSDUCERS

Dennis R. Dietz, Littleton, Colo., assignor to Technicare Corporation, Solon, Ohio

Filed Sep. 12, 1983, Ser. No. 530,687

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—625 **10 Claims**



1. A selectable focus annular array ultrasonic transducer comprising a concave of piezoelectric material which is separated into a plurality of concentric rings including a central disc-shaped element and capable of being selectively focused over consecutive regions of a given depth of field by activating rings of increasing radii in combination with said disc-shaped element and rings activated in shorter field regions, if any, as the transducer is focused at increasing depths of field; each ring exhibiting a width selected in accordance with a predetermined phase criterion such that the received signal phase error across the ring width does not exceed a given signal phase change for signals received from the nearest field point at which the ring is initially activated.

4,537,075
POSITION CONTROL

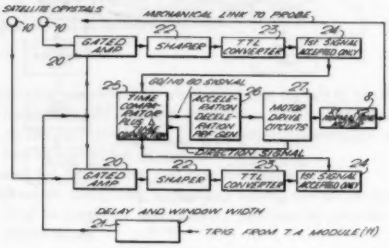
Graham Jackson, Lancashire, and Ryszard Surawy, Chippenham, both of England, assignors to British Aerospace Public Limited Company, London, England

Continuation of Ser. No. 401,218, Jul. 23, 1982, abandoned. This application Jun. 1, 1984, Ser. No. 616,780

Claims priority, application United Kingdom, Jul. 25, 1981, 8123024

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—634 **9 Claims**



1. Ultrasonic test equipment, comprising

a transducer head having primary transducer means, mounted on said transducer head, for emitting a pulsed beam of ultrasonic energy towards a workpiece to be tested and for receiving energy reflected back from said workpiece for subsequent formation of signals indicative of workpiece flaws;

drive pulse supply means, connected to said primary transducer means, for causing said primary transducer means to emit said beam; and

motor drive support system means for relatively moving said workpiece and transducer head to scan said beam across said workpiece and, during such scanning, for automatically regulating the angle of incidence between said beam and a surface of said workpiece, said support system means including

at least two receive-only satellite transducers supported by said transducer head at respective sides of the axis of said beam so as to receive respective portions of said reflected energy of each pulse of said beam emitted by said primary transducer means at respective times dependent upon said angle of incidence,

an angle control motor and associated motor drive circuit means for relatively moving said transducer head and workpiece to vary said angle of incidence, and

time comparator means, connected between said satellite transducers and said motor drive circuit means for controlling said drive circuit means by comparing the timing of said respective reflected energy pulses received by said satellite transducers.

4,537,076
APPARATUS FOR AND METHOD OF RANDOM VIBRATION CONTROL

David R. Lax, Irvine, Calif.; Michael Page, Reading, and James S. Johnstone, Surry, both of England, assignors to Schlumberger Electronics (U.K.) Limited, Farnborough, England

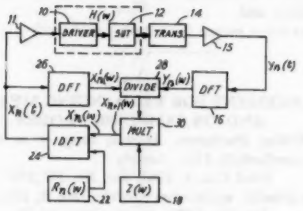
Filed Jan. 16, 1984, Ser. No. 571,163

Claims priority, application United Kingdom, Jan. 26, 1983, 8302169

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—662 **11 Claims**

1. In apparatus for random vibration control, of the type comprising means for controlling a driver for imparting vibrations to a system under test, means for receiving a signal from a transducer sensing the actual vibrations of the system under test, and a feedback loop arranged between the said means to equalize the apparatus to a state in which the power spectrum of the actual vibrations approximates a reference power spectrum, wherein the feedback loop includes means for performing the discrete Fourier transfer (DFT), means for performing the inverse discrete Fourier transform (IDFT), equalizing means responsive to the output of the DFT means and the reference power spectrum to establish the input to the IDFT means, and means for randomizing the phases of the components of the drive signal for the driver provided by the IDFT means, the improvement wherein the equalizing means comprise first means operative to compare the output of the DFT means with the corresponding drive signal in the frequency domain and second means responsive to the reference power spectrum and to the first means to derive the input to the IDFT means in accordance with the reference power spectrum modified by the results of the comparison to equalize the power spectrum of the actual vibrations to the reference power spectrum.



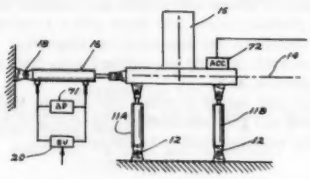
4,537,077
LOAD DYNAMICS COMPENSATION CIRCUIT FOR SERVOHYDRAULIC CONTROL SYSTEMS

Allen J. Clark, and Dale N. Maue, both of Minnetonka, Minn., assignors to MTS Systems Corporation, Eden Prairie, Minn.

Filed Feb. 8, 1984, Ser. No. 578,055

Int. Cl.³ G01N *29/00, 3/32;* B06B *1/18;* G01M *7/00*

U.S. Cl. 73—665 **4 Claims**



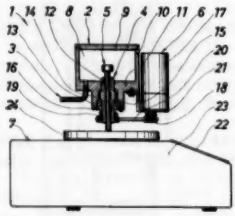
1. In a servo controlled displacement generating apparatus having control means for generating an error signal representing the desired displacement of a servovalve that will provide a desired displacement of a heavy dynamically operated load, said load being driven by an actuator having an area and a displacement, said actuator being provided with hydraulic oil through said servovalve, the improvement comprising:

means for providing a compensation signal summed with said error signal, which compensation signal is a function of the load acceleration and actuator force scaled through a differentation function including scaling factors relating to the actuator area, divided by factors comprising functions of the compliance of the oil and the flow gain of the servovalve.

4,537,078
PRECISION PRESSURE GAUGE

Kotohiko Sekoguchi, 18-8, Hinosato 6-chome, Munakata-shi, Fukuoka-ken, Japan, and Yoshiteru Sonoda, Osaka, Japan, assignors to Kotohiko Sekoguchi and Fujikin International, Inc., both of Osaka, Japan

Filed Nov. 21, 1983, Ser. No. 553,913
Claims priority, application Japan, Nov. 22, 1982, 57-205287; Nov. 22, 1982, 57-205288
Int. Cl.³ G01L *7/16*
U.S. Cl. 73—744 **8 Claims**

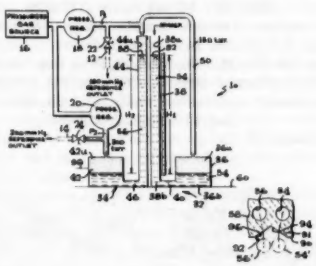


1. A precision pressure gauge for measuring the pressure of a fluid applied thereto, said gauge comprising:
a stationary cylinder having a cylinder chamber one end of which has an opening therein;
means connected directly to said cylinder for applying said fluid to said chamber;
a rotatable sleeve mounted in said cylinder;
a ram extending through said rotatable sleeve and freely rotatable with respect to said sleeve,
said ram having a first end extending into said chamber and a second end extending out of said sleeve;
drive means for rotating said sleeve relative to said cylinder; and,
weight measuring means including a receiver to which movement is imparted by axial movement of said ram in response to fluid pressure in said chamber.

4,537,079
MULTI-PRESSURE MANOMETER

Arnold S. J. Lee, 1033 Hilts Ave., Los Angeles, Calif. 90024

Filed Mar. 13, 1984, Ser. No. 589,147
Int. Cl.³ G01L *7/18*
U.S. Cl. 73—747 **3 Claims**

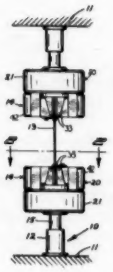


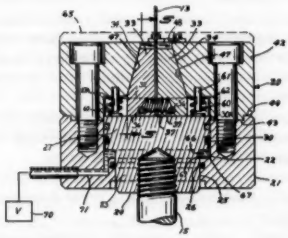
3. Apparatus for producing a number n of reference outlet pressures, where n is an integer that is more than one, wherein each outlet pressure is precisely related to every other outlet pressure, comprising:
a number n of reservoirs, each having an upper portion containing gas and a lower portion;
a number n of vertical tubes, each having upper and lower portions, the upper portions of the tubes being positioned so the levels of any liquids therein can be compared;
a number n of lower couplings, said reservoirs and tubes arranged in pairs, with each lower coupling connecting together the lower portion of a reservoir and of a tube of the same pair;
a manometer liquid lying in each lower coupling and the lower portions of the reservoir and tube it connects;
a number n-1 of upper couplings, each containing gas and connected to the upper portion of a reservoir of one of said pairs to the upper portion of a tube of another pair;
means for establishing a base pressure in the upper portion of that one of said tubes which is not connected to an upper coupling;
a number n of pressure regulator means, each having an outlet coupled to gas in the upper portion of a different reservoir, for applying a controllable gas pressure thereto; and
a transparent housing forming said vertical tubes at spaced locations, the outside walls of said housing including a concave region formed by a pair of walls that converge, said converging walls positioned so that two of said tubes appear closer together than their actual separation, to a person viewing said tubes through said pair of walls from a position outside said housing.

4,537,080
SIDE LOADING SPECIMEN GRIP

John A. Christiansen, Minneapolis, Minn., assignor to MTS Systems Corporation, Eden Prairie, Minn.

Continuation-in-part of Ser. No. 350,056, Feb. 18, 1982, abandoned. This application Mar. 1, 1984, Ser. No. 585,354
Int. Cl.³ G01N *3/04*
U.S. Cl. 73—857 **12 Claims**





1. A side loading specimen grip assembly suitable for use in both tensile and compressive loading of a specimen comprises a main mounting body, said main mounting body being adapted to be loaded by an actuator in direction along a longitudinal axis, means on said main mounting body defining a slide on an upper surface thereof, jaw means mounted on said slide

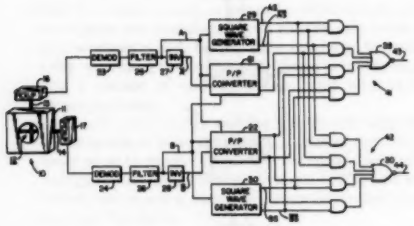
for movement transverse to the longitudinal axis, said jaw means comprising a pair of opposed grip jaws mounted on said slide for simultaneous longitudinal movement therewith when the mounting body is loaded by the actuator, the grip jaws being movable toward and away from each other and having wedge surfaces thereon, a housing mounted on said main mounting body and having cam surfaces mating with said wedge surfaces so that upon movement of the housing relative to the mounting body along said longitudinal axis in a first direction the cam surfaces force said jaws to move toward each other, and cooperating cylinder and piston means between said main mounting body and said housing forming a chamber into which hydraulic fluid under pressure may be introduced to force the housing in direction along the longitudinal axis to tend to force the cam surfaces against the wedge surfaces and force the grip jaws together, said housing having a first recess so that the side portions of said grip jaws are accessible from the exterior of said housing and above the mounting body to permit installation and removal of a specimen from a side of the grip jaws and specimen grip assembly without the need for longitudinal movement of the grip jaws.

4,537,081

FLOW METERING CIRCUIT AND METHOD

John K. Max, 1420 Healdsburg Ave., Healdsburg, Calif. 95448

Filed Dec. 15, 1983, Ser. No. 562,484
Int. Cl.³ G01F *15/00*
U.S. Cl. 73—861.77 **9 Claims**



1. A circuit arrangement for use in a fluid metering device for providing an output signal accurately representing a fluid flow, said metering device sampling the fluid flow and providing a multiphase flow signal including a plurality of input phase signals conjointly representing the fluid flow, wherein said circuit arrangement comprises:

reference-sequence means responsive to each said input phase signal for deriving therefrom a reference sequence of instantaneous graduated reference levels;

comparison means responsive to each said input phase signal for comparing each said signal to a cross-associated reference sequence;

reference-crossed means connected to said comparison means for providing a reference-crossed signal associated with each said input phase signal, each said reference-crossed signal indicating the moment and direction said input phase signal crosses the levels of the cross-associated reference sequence; and

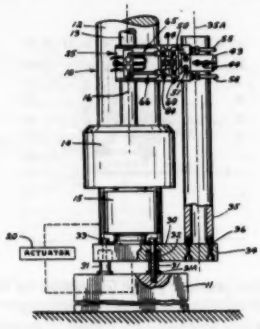
logic means responsive to said reference-crossed signals for providing an output signal indicating the amount and direction of said fluid flow.

4,537,082

REFERENCE FRAME AND HOLD-DOWN SUPPORT SYSTEM FOR REMOTE SUPPORTED AXIAL TORSIONAL EXTENSOMETER

Harry R. Meline, Minnetonka, and Richard A. Meyer, Carver, both of Minn., assignors to MTS Systems Corporation, Eden Prairie, Minn.

Filed Jan. 24, 1984, Ser. No. 573,821
Int. Cl.³ G01N *3/02*
U.S. Cl. 73—794 **16 Claims**



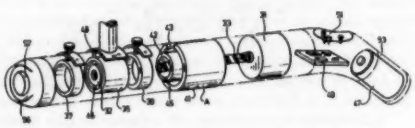
1. An extensometer support for use in combination with a test frame having a base, and having means for loading a test specimen along a specimen loading axis generally perpendicular to the base, and for loading said specimen for rotation about its specimen axis, the improvement comprising a support plate, an upright column fixed to said support plate and laterally offset from a specimen when the plate is installed on a base for a test frame holding a test specimen, a plurality of flexure standoff members for mounting the support plate relative to the base in a position spaced from said base and connected to the base only through said standoff members, means at the upper end of said column for supporting an extensometer in engagement with a specimen to be tested, said standoff members providing a flexible connection to the base which will not substantially deflect extensometer members supported relative to and operatively engaging a specimen as the base deflects during loading of the specimen.

4,537,083

DEVICE FOR IMPARTING CONTINUOUS PASSIVE MOTION TO HUMAN JOINTS

John H. Saringer, Toronto, Canada, assignor to Imasco-CDC Research Foundation, Toronto, Canada

Division of Ser. No. 362,896, Mar. 29, 1982, Pat. No. 4,487,199.
This application Oct. 15, 1984, Ser. No. 660,704
Claims priority, application Canada, Oct. 23, 1981, 388659
Int. Cl.³ F16H *27/02*
U.S. Cl. 74—89.15 **12 Claims**



1. An actuator for imparting back and forth motion in a slow rhythmic cycle, comprising,

a support housing having a longitudinal slot defining a guide track,

a traveller operatively mounted to said support housing for back and forth motion relative to said housing,

a tubular housing mounted in said support housing, said tubular housing having a longitudinally extending slot offset relative to said guide track, and

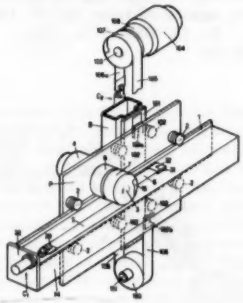
a drive member mounted inside said tubular housing adapted to drive said traveller with said back and forth motion, said traveller including a travel element mounted inside said support housing operatively connected through the longitudinally extending slot in said tubular housing to said drive member, said travel element being connected to a travel member mounted for travel along said guide track.

4,537,084

RECTILINEAR TRANSFER MECHANISM WITH PULLEYS AND BELTS

Jean R. Passemard, Bailly Romainvilliers, and Gaston Kélédjian, Boulogne Billancourt, both of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Sep. 10, 1982, Ser. No. 416,714
Claims priority, application France, Sep. 15, 1981, 81 17427
Int. Cl.³ F16H *27/02, 29/02*
U.S. Cl. 74—89.22 **6 Claims**



1. An apparatus for providing rectilinear sliding motion of a first object in a first direction in relation to a relatively fixed second object, said first object being longer than said second object in said first direction, said apparatus comprising:

means connected to one of said objects for guiding said motion;

a motor fixed to said second object, said motor having an output shaft rotatable about an axis transverse to said first direction;

first and second pulleys having the same diameter and fixedly mounted on said shaft in axially staggered relation;

a straight groove formed in each of said first and second pulleys, each said groove merging with the cylindrical peripheral surface of a corresponding one of said pulleys by a large diameter fillet, each said groove being capped by a complementary piece having an outer surface which is shaped to reconstruct the cylindrical surface of said pulley, said grooves and fillets of said two pulleys having opposite senses;

a first belt having a first end inserted and fixed in said groove of said first pulley, said first belt having a second end fixed relative to said first object at a first point;

a second belt having a first end inserted and fixed in said groove of said second pulley, said second belt having a second end fixed relative to said first object at a second point, wherein said first and second belts are wound on said first and second pulleys in opposite rotational directions, whereby rotation of said motor shaft causes one belt to be wound and the other belt to be simultaneously unwound [.]; and

means for moving said second object in a second direction, transverse to said first direction, in relation to a relatively fixed third object, said third object being longer than said second object in said second direction, said means for moving comprising:

(a) means connected to one of said second and third objects for guiding the motion of said second object relative to said third object;

(b) a second motor fixed relative to said third object and having an output shaft rotatable about an axis transverse to said second direction;

(c) third and fourth pulleys mounted on said output shaft of said second motor, said third and fourth pulleys being respectively indentical to said first and second pulleys;

(d) a third belt having a first end fixed to said third pulley and a second end fixed to said second object;

(e) a fourth belt having a first end fixed to said fourth pulley and a second end fixed to said second object; and

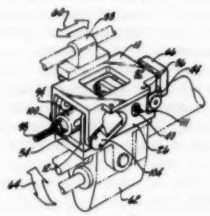
(f) an elastic tensioning device associated with said fourth belt for tensioning said fourth belt.

4,537,085

PIVOTAL LIFT APPARATUS

Al L. Valentine, 21658 Summerdale, Southfield, Mich. 48034

Filed Jan. 24, 1983, Ser. No. 460,109
Int. Cl.³ F16H *21/44*
U.S. Cl. 74—99 A **12 Claims**



1. Apparatus for effecting pivotal movement of a load comprising:

a first housing;

a second housing including means adapted for mounting said load thereon;

means mounting said second housing for pivotal movement on said first housing about a fixed axis;

at least a pair of elongate, overlapping cam tracks respectively defined in said first and second housings, said pair of cam tracks extending obliquely relative to each other;

cam means within said pair of cam tracks for transferring force between said first and second housings causing pivotal movement of said first housing relative to said second housing about said fixed axis in response to displacement of said cam means within said cam tracks; and

motor means carried by and pivotally mounted on said housings and coupled with said cam means for displacing said cam means within said cam tracks to cause pivotal movement of said first housing relative to said second housing about said fixed axis.

4,537,086

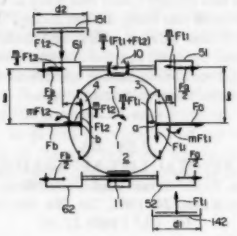
INFINITELY VARIABLE TORIC TRANSMISSION

Hideo Okoshi, Fujisawa, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 13, 1984, Ser. No. 579,374
Claims priority, application Japan, Feb. 21, 1983, 58-26290
Int. Cl.³ F16H *15/08, 15/00*
U.S. Cl. 74—201 **2 Claims**

1. An infinitely variable toric transmission having a housing, input and output shafts rotatably and coaxially supported in said housing, toric input and output disks fitted on and engaged with said input and output shafts, respectively, for rotation

together, the opposed surfaces of said disks cooperating with each other to form a toric cavity, two right and left traction rollers disposed in said toric cavity symmetrically with respect to the axis of said input and output shafts, trunnion devices rotatably supporting said traction rollers and supported in said housing through upper and lower support link members for rightward and leftward pivotal movement about a pivot axis perpendicular to the rotational axes of said traction rollers, and pressing means for abutting said input and output disks and said traction rollers into engagement with each other and generating a traction force, one of said upper and lower support link



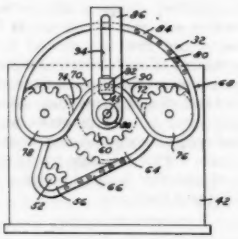
members being supported in said housing by a sliding post for slight rightward and leftward movement and the other of said upper and lower support link members having its central portion tiltably supported in said housing by a spherical post, characterized in that hydraulic cylinder devices are provided which extend on the upper and lower pivot shaft ends, respectively, of said right and left trunnion devices, the right and left cylinder diameter of said cylinder devices which is adjacent to said spherical post is larger than the right and left cylinder diameter of said cylinder devices which is adjacent to said sliding post, and the cylinder devices on each diagonal are conjunctioned with each other by pipings.

4,537,087

ROTARY CHAIN DRIVE MECHANISM WITH PERIODIC OUTPUT DWELL

William M. Faitel, Detroit, Mich., assignor to Lamb Technicon Corp., Warren, Mich.

Filed Apr. 29, 1983, Ser. No. 490,123
Int. Cl.³ F16H *35/02, 27/04*
U.S. Cl. 74—394 **8 Claims**



1. A rotary drive mechanism with periodic output dwell comprising

input means including means for imparting rotary input motion about a fixed axis,

a first sprocket coaxial with said fixed axis and fixed against rotation about said fixed axis,

a frame coupled to said input means for corotation with said input means about said fixed axis,

second and third sprockets coplanar with said first sprocket and carried by said frame for free rotation about axes disposed on opposite sides of said fixed axis, said axes being rotatable about said fixed axis conjointly with said frame,

said frame including a chain guide which is coplanar with all of said sprockets and extends between said second and third sprockets,

an endless chain slidably trained along said guide, around said second and third sprockets, and around a circumferential portion of said first sprocket adjacent to and radially inwardly of said guide,

an arm mounted for rotation about said fixed axis, and

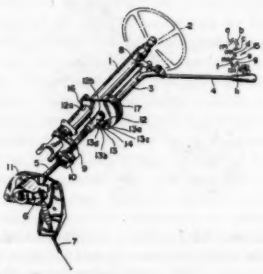
means slidably carried by said arm and affixed to said chain for rotating said arm about said fixed axis as a combined function of rotation of said frame, said second and third sprockets, and said chain guide about said first axis, and motion of said chain around said sprockets and along said guide.

4,537,088

COLUMN SHIFT TYPE GEAR SELECTOR DEVICE FOR AN AUTOMATIC POWER TRANSMISSION OF AN AUTOMOTIVE VEHICLE

Shikibu Kubota, Musashino, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jun. 11, 1982, Ser. No. 387,692
Claims priority, application Japan, Jun. 17, 1981, 56-92123
Int. Cl.³ G05G *9/16, 5/02*
U.S. Cl. 74—473 SW **11 Claims**



1. A column shift type gear selector device for an automatic power transmission of an automatic vehicle comprising:

a manually operated selector lever mounted on a steering column for controlling the shift operation of said automatic power transmission;

a control rod connected to said selector lever and extending along said steering column and movable in accordance with movement of said selector lever in axial and circumferential directions with respect to the axis thereof, to shift the transmission to a desired gear ratio;

a linkage connected to said control rod and to a power transmission gear selector mechanism in the automatic power transmission;

a locking means associated with said control rod for locking said control rod to block the shift operation in at least one predetermined transmission gear position, said locking means incorporating an unlocking means associated with said control rod and responsive to axial movement of the latter for unlocking said locking means to allow a shifting operation of said control rod from said at least one predetermined transmission gear position to another gear position; and

a click mechanism positioned adjacent said control rod, said click mechanism including a first stationary member mounted on said steering column and located adjacent said control rod and a second movable member movable with said control rod, said second member being biased for clicking engagement with said first member at the

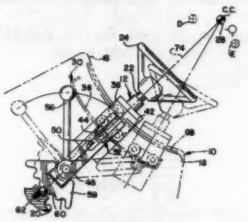
control rod positions respectively corresponding to respective transmission gear positions, said first member having an axial length sufficiently long to allow axial movement of said second member while maintaining clicking engagement between said first member and said second member.

4,537,089

STEERING WHEEL

Casimir Moneta, Chicago, Ill., assignor to J. I. Case Company, Racine, Wis.

Filed Jan. 14, 1983, Ser. No. 457,844
Int. Cl.³ B62D *1/18*
U.S. Cl. 74—493 **25 Claims**

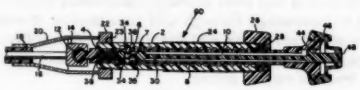


24. Vehicle station (14), for an operator thereat, equipped with longitudinally slotted console face structure (10) distal to the operator and relatively proximal telescoping shaft (130) and column (12) structure operatively related therewith in the face slot and constrained by means providing for equivalent movement consistent with the longitudinal face slot (26), said console face structure and its longitudinal slot having an appreciably curved contour concave with respect to the operator and said slot comprising an approximately bottom to top curvilinear face slot, means (20) supporting the longitudinally slotted console face structure and telescoping shaft and column structure in the operative relationship described and with the telescoping shaft (130) further telescopically related to the longitudinal slot operatively, and a wheel (24) for the operator to steer the vehicle, said telescoping shaft having means (22) thereon supporting the wheel for wheel tilting movement up and down therewith, for wheel telescoping movement in and out therewith, and for independent rotation relative thereto.

4,537,090

VERNIER CONTROL DEVICE

Michael E. Jones, Wooster, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 19, 1983, Ser. No. 562,772
Int. Cl.³ F16C *1/10*
U.S. Cl. 74—502 **9 Claims**

1. An improved vernier control device for selectively moving an object in gross or vernier, incremental amounts, said device comprising a housing secured against movement with respect to the object and having an open-ended bore therethrough surrounded by a wall of the housing, a control sleeve slidably received within the housing bore and moveable in opposite axial and rotational directions with respect thereto, said sleeve having one end rotatably secured to the object and having a bore therewithin extending from the opposite end thereof, an aperture extending through the wall of the sleeve between the housing bore and the sleeve bore, an operating rod disposed in the sleeve bore and moveable axially in opposite directions with respect thereto, thread means having a prescribed pitch disposed on the housing bore wall intermediate said wall and the sleeve, and thread engagement means moveable radially through the control sleeve aperture into and out of engagement with the thread means according to the position of the operating rod along the sleeve bore, wherein the improvement is characterized by said device provided with lower friction and having improved resistance to wear of the thread means and having the ability to withstand increased axial force between the thread engagement means and the thread means as a result of said thread engagement means comprising:

a pair of apertures extending through opposite sides of the sleeve wall between the housing bore and the sleeve bore,

first and second thread engaging members respectively moveably disposed within each aperture, said members having a ball-like configuration dimensionally adapted to move radially inwardly and outwardly therethrough,

a third member disposed within a bore through the operating rod adjacent the end thereof closest to the end of the sleeve secured to the object and moveable axially along the sleeve bore in response to axial movement of the operating rod therewithin, said member having a ball-like configuration dimensionally adapted such that axial movement thereof to an intermediate position between the first and second members in response to movement of the operating rod to a thread engagement position within the sleeve bore urges each of said members radially outwardly through the respective apertures a distance sufficient to establish threaded engagement with the thread means,

biasing means disposed in the sleeve bore intermediate the operating rod and the end of the sleeve to which the object is secured, said biasing means adapted to urge the operating rod axially along the sleeve bore in a direction away from said end to at least the position at which the third member is positioned intermediate the first and second members,

stop means secured to the sleeve holding the operating rod against the biasing means when the third member is in the intermediate position between the first and second members so that the sleeve is caused to move axially along the housing bore and move the object in incremental amounts determined by the thread means pitch in response to rotation of the sleeve,

and means enabling the first and second members to move radially inwardly a distance sufficient to cause the disengagement thereof with the thread means response to axial movement of the operating rod in a direction towards the end of the sleeve secured to the object enabling movement of the object in gross amounts in response to axial movement of the sleeve in gross amounts within the sleeve bore.

4,537,091

MATCHED METAL DIE COMPRESSION MOLDED STRUCTURAL RANDOM FIBER SHEET MOLDING COMPOUND FLYWHEEL

Satish V. Kulkarni, San Ramon; Richard M. Christensen, Danville, both of Calif., and Richard H. Toland, West Chester, Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 190,305, Sep. 24, 1980, abandoned. This application Apr. 1, 1983, Ser. No. 479,193
Int. Cl.³ G05G *1/00, 3/00*
U.S. Cl. 74—572 **4 Claims**

1. A matched metal die compression molded flywheel body which is fundamentally planar isotropic only in all planes perpendicular to an axis of rotation, which comprises:

a multiplicity of plies of sheet molding compound;

each of said plies comprising a randomly oriented fiber and a resin compacted to be planar isotropic only in the plane of each said ply; and

each of said plies being positioned essentially perpendicular to an axis of rotation of said flywheel body so that said

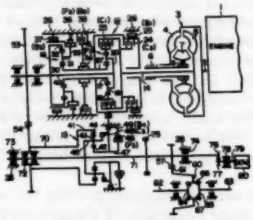
flywheel body is fundamentally planar isotropic only in all planes perpendicular to said axis of rotation.

4,537,092

TRANSVERSE TYPE AUTOMATIC TRANSMISSION WITH THROUGH LAY SHAFT

Kunio Morisawa, Okazaki, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Sep. 14, 1982, Ser. No. 418,026
Claims priority, application Japan, Sep. 17, 1981, 56-147436
Int. Cl.³ F16H *37/08, 37/00, 57/10*
U.S. Cl. 74—695 **3 Claims**



1. An automatic transmission for an automotive vehicle, comprising:

(a) a fluid torque converter comprising a first rotational power input member and a first rotational power output member, said first rotational power input member and said first rotational power output member both being rotatable about a first axial line;

(b) a first gear transmission mechanism comprising a second rotational power input member and a second rotational power output member and being selectively controllable to produce any one of a plurality of speed ratios between said second rotational power input member and said second rotatinal power output member, said second rotational power input member and said second rotational power output member both being rotatable about said first axial line, said second rotational power input member being rotationally connected to said first rotational power output member;

(c) a second gear transmission mechanism comprising a third rotational power input member and a third rotational power output member and being selectively controllable to produce any one of a plurality of speed ratios between said third rotational power input member and said third rotational power output member, said third rotational power input member and said third rotational power output member both being rotatable about a second axial line parallel to said first axial line and displaced laterally therefrom;

(d) a rotational power transfer mechanism comprising a first gear wheel drivingly connected with said second rotational power output member so as to be rotatable about said first axial line and a second gear wheel drivingly connected with said third rotational power input member so as to be rotatable about said second axial line and which transfers rotational power between said second rotational power output member and said third rotational power input member; and

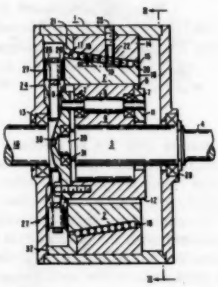
(e) a through lay shaft which extends along and is rotatable about said second axial line, which is drivingly connected with said third rotational power output member and which passes through said second gear transmission mechanism and said second gear wheel, said second gear wheel being rotatably supported primarily by said through lay shaft.

4,537,093

FIXED RATIO TRACTION ROLLER TRANSMISSION

Charles E. Kraus, Austin, Tex., assignor to Excelermatic Inc., Austin, Tex.

Filed Oct. 27, 1983, Ser. No. 545,833
Int. Cl.³ F16H *13/08*
U.S. Cl. 74—798 **13 Claims**



1. A traction roller transmission comprising a traction ring structure having an inner traction surface, a sun roller disposed centrally within said traction ring structure and having a circumferential traction surface, said sun roller having a diameter substantially smaller than the inner diameter of said traction ring structure such that an annular space is formed between the traction surfaces of said sun roller and said traction ring structure and a number of planetary traction rollers rotatably supported in said annular space between, and in engagement with, the traction surfaces of said sun roller and said traction ring structure, said traction ring structure consisting of two concentric sleeves having complementary conical surfaces opposite, and spaced from, one another such that an annular gap is formed therebetween, a plurality of bearing balls disposed in said annular gap so as to facilitate relative axial and rotational motion of said two concentric sleeves, and axial cam means arranged adjacent the radially wider end of said inner sleeve for axially forcing said inner sleeve into said outer sleeve when a torque is transmitted through said transmission thereby to compress said inner sleeve and force the traction rollers into firm engagement with the traction surfaces of said sun roller and said traction ring structure.

4,537,094

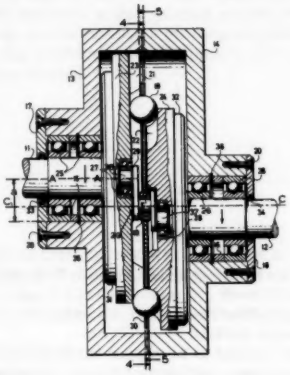
GEAR TRANSMISSION

Miloslav Bursa, Brno; Frantisek Musil, Blansko, and Ladislav Podmela, Brno, all of Czechoslovakia, assignors to Prvni brnenska stojirna, koncernovy podnik, Brno, Czechoslovakia

Filed Feb. 14, 1983, Ser. No. 466,038
Int. Cl.³ F16H *1/28*
U.S. Cl. 74—804 **6 Claims**

1. A gear equipment for transmitting rotating motion, comprising a first and a second parallel confronting disc-like trans-

mission member rotating about parallel offset axes, the confronting faces of the transmission members being provided with face transfer grooves in which there are positioned antifrictionally disposed transfer elements, in the form of balls, a



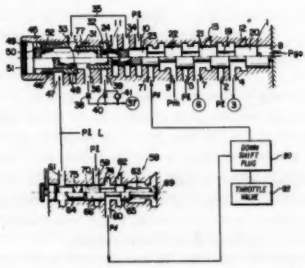
guide gear including a guide plate which is disposed between the transmission members and which retains the balls uniformly spaced angularly in a circle, and means mounting the guide plate for rotation about a fixed axis parallel to said axes of the transmission members.

4,537,095

HYDRAULIC CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION

Kunio Morisawa, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 160,575, Jun. 18, 1980, abandoned. This application Feb. 8, 1983, Ser. No. 464,859
Claims priority, application Japan, Jun. 26, 1979, 54-681
Int. Cl.³ B60K *41/02*
U.S. Cl. 74—868 **13 Claims**



1. A hydraulic control system for an automatic transmission of an engine driven vehicle, the automatic transmission having at least drive and low speed ranges and reverse drive and the engine having a throttle, the control system comprising:

first, second and third coaxial valves, said valves being axially displaceable in opposite first and second directions, said second valve axially abutting said first valve and axially spaced from said third valve;

stop means for limiting axial movement of said third valve in said first direction;

means for introducing governor fluid pressure to bias said first valve in said second direction, said governor fluid pressure being directly related to the speed of said vehicle;

first port means for introducing line pressure to bias said third valve in said first direction to said stop means;

friction engaging means for permitting engine braking of said vehicle;

second port means for selectively conducting line pressure to actuate said friction engaging means when said low speed range is selected, said second port means including means for applying line pressure to bias said second valve in said first direction;

first spring means interconnecting said second and third valves for opening said second port means to accuate said friction engaging means with line pressure when force in said first direction caused by said first spring means exceeds governor pressure biasing said first valve in said second direction and for positively moving said first and second valves to their limit in said first direction; and

means responsive to said throttle for supplying a detent pressure of a predetermined level to act on said first valve in a direction opposite to said governor pressure when said throttle means exceeds a predetermined level and for preventing application of said detent pressure to said first valve when engine braking is effective, said detent pressure supply means comprising a regulator valve including:

a first input port receiving said line pressure;

an output port generating said detent pressure;

a first spool having first and second lands defining a first chamber in continuous communication with said output port and with a second chamber by means of an oil path through said first land;

a drain port;

a spring acting on said second land in substantially equal opposition to fluid pressure in said first chamber for oscillating said first spool to alternatively connect said first input port and said drain port with said first chamber to generate the predetermined level of detent pressure;

a second spool coaxial with said first spool and disposed in said second chamber; and

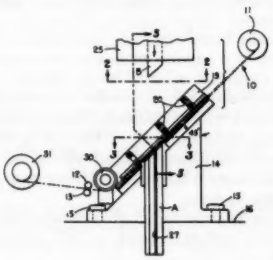
a second input port communicating with said second chamber and receiving said line pressure when said low speed range is selected for forcing said first and second spools against said spring to prevent generation of detent pressure at said outlet port.

4,537,096

METALLIC CARD CLOTHING AND METHOD AND APPARATUS FOR MAKING SAME

John D. Hollingsworth, P.O. Box 516, Greenville, S.C. 29602

Division of Ser. No. 167,069, Jul. 9, 1980, Pat. No. 4,453,431, which is a division of Ser. No. 904,004, Sep. 6, 1978, Pat. No. 4,233,711. This application Feb. 27, 1984, Ser. No. 584,145
Int. Cl.³ B21F *45/10*
U.S. Cl. 76—1 **4 Claims**



1. Apparatus for punching teeth in a metallic strip comprising:

means for continuously longitudinally feeding said strip;

a surface for supporting and guiding a side portion of said strip as the strip is fed thereover;

a driven punch opposite said surface;

a die surface being inclined in an acute angle in relation to the direction of travel of said driven punch operating in cooperation therewith; and

guide means positioning said strip as it is fed between said die surface and said punch.

4,537,097

METHOD AND APPARATUS FOR MANUFACTURING CUTTING ELEMENTS PARTICULARLY FOR DEEP DRILLING

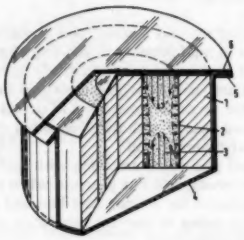
Roland Illerhaus, Spore, Singapore, and Rainer Jürgens, Celle, Fed. Rep. of Germany, assignors to Christensen, Inc., Salt Lake City, Utah

Filed Dec. 29, 1983, Ser. No. 566,607

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1983, 3300357

Int. Cl.³ B22F *7/08, 3/14;* **B23P** *5/00;* **B24D** *3/10*

U.S. Cl. 76—108 A **19 Claims**



1. A method for the manufacture of cutting elements containing diamond material bound in a metal matrix mass which comprises:

(a) providing a mold block, said mold block having at least one recess;

(b) providing a base powder mixture, said base power mixture containing components comprising solid particulate diamond material and solid particulate metal matrix carrier material;

(c) inserting said base powder mixture into said recess in said mold block;

(d) externally hermetically enclosing said mold block, after step (c), in a capsule enclosure, said capsule enclosure being composed of thin-walled, flexible, pressure-tight and temperature-resistant material, said capsule enclosure surrounding the outer surface of said mold block;

(e) sintering the hermetically enclosed mold block of step (d) at elevated temperature and pressure so that said diamond material is closely bound to said metal matrix material in a metal matrix mass;

(f) reducing the temperature and pressure about said hermetically enclosed mold block so that said mold block is cooled;

(g) removing said capsule enclosure from about said mold block; and

(h) removing at least one finished cutting element comprising said diamond material bound in said metal matrix mass from said recess in said mold block.

4,537,098

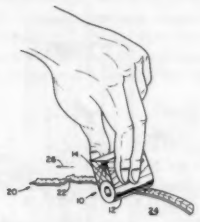
TOOL FOR STRAIGHTENING JEWELRY CHAIN

John F. Keck, P.O. Box 35, Madison, Pa. 15663

Filed Jun. 4, 1984, Ser. No. 616,570

Int. Cl.³ B25B *31/00*

U.S. Cl. 81—488 **5 Claims**



1. A tool for removing kinks and bends from jewelry chain comprising:

a. a cylindrical member formed of a hard, smooth-surfaced, non-metallic material;

b. a handle adapted to be gripped between the thumb and fingers of a hand, said handle being of a thickness approximately equal to the diameter of said cylindrical member and having a concave, semicylindrical recess on one edge thereof; and

c. adhesive means securing said handle by the recessed edge to said cylindrical member along the length thereof.

4,537,099

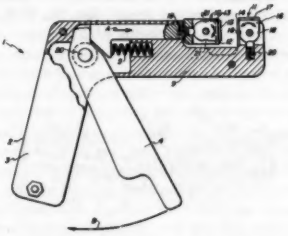
TENSIONING AND BRAKING PLIERS

Stanley M. Oster, 871 SW. 88 Ter., Plantation, Fla. 33024, and Lester Axelrod, 3650 N. 36 Ave., Hollywood, Fla. 33021

Filed Apr. 15, 1983, Ser. No. 485,276

Int. Cl.³ B25B *7/00*

U.S. Cl. 225—93 **2 Claims**



1. A tensioning and breaking plier device for removing the interior portion of a sheet of vitreous material between at least two holes drilled in said material, there being score lines connecting said holes, said device comprising:

a handle means operable for manipulating said device;

a pair of cooperating means constructed and arranged for gripping, at a working position, said sheet of vitreous material on opposite sides of said vitreous material to facilitate the tensioning and breaking of the sheet of vitreous material along the score line;

connecting means connected between said handle means and each of said cooperating means

for moving said pair of cooperating means towards one another in response to operation of said handle means to grip the sheet of vitreous material at said working position; and

each of said cooperating means having an anvil means and a movable head means, each of said head means having a

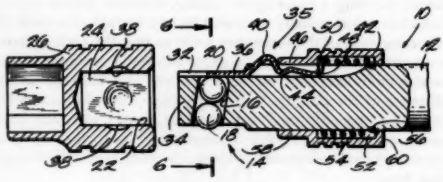
pressure applying surface and a passive surface which are connected for movement within said anvil means to selectively position one of either said pressure applying surface or said passive surface at said working position, said anvil means having portions engaging said vitreous material on opposite sides of said score line when said head means passive surface is at said working position, whereby the running, reverse running or breaking said sheet along said score line is determined by the position of said positioned surfaces selected.

4,537,100

PUSH-ON/QUICK RELEASE LOCKING ARRANGEMENT FOR SOCKET WRENCH EXTENSION

Bernhard Palm, 17420 Continental Dr., Brookfield, Wis. 53005

Filed Feb. 28, 1984, Ser. No. 584,512
Int. Cl.³ B25B *13/00*
U.S. Cl. 81—177.85 **8 Claims**



3. A socket wrench extension provided with a push-on/quick release locking arrangement comprising,

a square drive end on said extension having flat drive faces,

a transverse bore through said drive end, lock means mounted in said bore for movement between a lock position in which the lock means projects from one end of the bore and a release position in which the lock means lies within the drive end,

said one end of said bore being closer to an end of said drive end than is the other end of said bore,

an axial groove in one of said drive faces intersected by said other end of said bore,

a slider including a lock tab mounted on the extension for slidable axial movement in said groove between an obstructing position in which said tab holds the lock means in said lock position and a non-obstructing position in which the lock means can move to said release position,

said extension having a cylindrical shaft terminating at said drive end,

an annular groove in said shaft adjacent said drive end,

a sleeve mounted on said shaft and having in-turned ends,

said slider being connected to said sleeve by means including an arm projecting radially into the space between said sleeve and said shaft adjacent an end of the sleeve closer to said drive end,

said arm being connected to said slider at a junction portion,

said spring having a coil engaged in said annular groove and enclosed in said space between the sleeve and the shaft and compressed against said arm to bias the sleeve and slider towards said drive end,

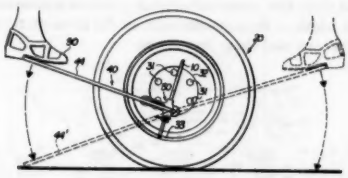
said slider being rockable on said junction portion to enable said lock tab to move radially out of said groove when acted on by said lock means moving to said release position.

4,537,101

LUG NUT REMOVER

Frank A. Eversole, 327 Windley Rd., Key Largo, Fla. 33037

Filed Dec. 12, 1983, Ser. No. 560,240
Int. Cl.³ B25B *13/58*
U.S. Cl. 81—180.1 **12 Claims**



1. A support assembly primarily designed for use in combination with a lug wrench means for removal of lug nuts from a wheel, said assembly comprising:

(a) body means comprising attachment means formed thereon and a mounting means integrally secured to said body means and structured to removably mount a lug wrench means thereon,

(b) a support rod movably secured to said body means and interconnected to said attachment means, and selectively positioned into engaging relation with a wheel on which said lug wrench means is mounted,

(c) locking means secured to said body means in fixed relation thereto and positionable into and out of frictional, substantially locking engagement with said support rod,

(d) said mounting means disposed to substantially orient and maintain the lug wrench means in substantially transverse relation to said support arm when the former is engaging a lug nut and the latter is engaging the wheel on which the lug nut is secured, and

(e) said lug wrench means comprising a lever arm portion extending outwardly from said body means when said lug wrench is supported on said mounting means; said lug wrench means further comprising an operative arm portion having one end connected to said lever arm portion and an opposite free end secured to a socket means; said lever arm portion disposed in substantially transverse relation to said operating arm portion,

(f) said lever arm portion being rotatably connected to said operating arm portion, said operating arm portion including an arm extension disposed in substantially perpendicular relation to said operating arm portion, a bearing arm mounted on a free end of said arm extension in perpendicular relation to said arm extension and disposable in interruptive relation to a path of travel of the movement of said lever arm portion relative to said operating arm portion;

(g) whereby a lever arm of the lug wrench is extended and maintained outwardly from the wheel for forceful engagement by the foot of one removing the lug nut.

4,537,102

METHOD OF SHEARING METAL BILLETS

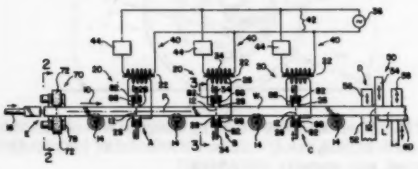
Norbert R. Balzer, Boaz, Ala., assignor to Park-Ohio Industries, Inc., Shaker Heights, Ohio

Filed Feb. 3, 1983, Ser. No. 463,592
Int. Cl.³ B26D *7/10*
U.S. Cl. 83—16 **10 Claims**

1. The method of shearing sections of predetermined gauge length from an elongated metal bar comprising the steps of:

(a) intermittently indexing the elongated bar longitudinally along a horizontal linear feed path through successive distances, corresponding to the said gauge length, to position each one of a plurality of spaced shear line zones of the bar successively at a plurality of heating stations, and thence at a shearing station, for a predetermined length of dwell time at each of said stations;

(b) moving the electrical contacts of a plurality of respective electrical resistance heating units into operative position, at respective ones of said heating stations during the dwell time of each said shear line zone thereat, with the work surfaces of said contacts in continuous mating surface contacting engagement throughout with localized surface areas of said bar located at and immediately adjacent the said shear line zones and extending across substantially the full width of the opposite sides of the cross-section of the bar at the said shear line zones;



(c) energizing the said resistance heating units during the interval their said contacts are engaged with the said bar at said heating stations to thereby effect direct resistance heating of said bar approximately uniformly throughout substantially the full cross-sectional extent of the bar at each of said bar shear line zones to only a partial degree of the total heating of each of said shear line zones, by all said heating units in toto, for subsequent shearing of the bar through said shear line zones; and,

(d) then successively shearing said bar through said heated bar shear line zones during their dwell at said shearing station.

4,537,103

ARRANGEMENT FOR A CUTTING DEVICE

Claes-Göran Flodin, Åsgatan 3, 441 51 Alingsås, Sweden

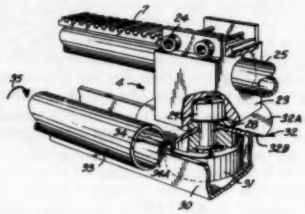
PCT No. PCT/SE82/00438, § 371 Date Aug. 18, 1983, § 102(e) Date Aug. 18, 1983, PCT Pub. No. WO83/02250, PCT Pub. Date Jul. 7, 1983

PCT Filed Dec. 22, 1982, Ser. No. 530,579

Claims priority, application Sweden, Dec. 22, 1981, 81076960

Int. Cl.³ B26D *1/20, 7/12*

U.S. Cl. 83—174 **12 Claims**



1. An apparatus for cutting a web of material, comprising:

a circular cutting blade having a circumferential cutting edge and being rotatable about an axis perpendicular to said blade; means for moving said cutting blade across the web so that said axis moves parallel to itself in a plane; a tubular accomodating member having a longitudinal axis extending essentially parallel to said plane and having a longitudinal slot therein defined by a metal edge receiving therein the circumferential cutting edge; and means biasing said tubular member to rotate so that said edge rests against said circumferential cutting edge; whereby said blade is rotated when said moving means moves said blade across the web and said cutting edge is sharpened.

4,537,104

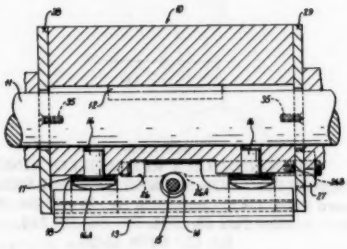
CUTTING HEAD FOR FILTER ASSEMBLER

Michael E. Dealto, Richmond, Va.; Joseph D. DiGiacomo, Pound Ridge, N.Y., and Clifford R. Marritt, Richmond, Va., assignors to Molins, Ltd., London, England

Division of Ser. No. 138,092, Apr. 7, 1980, Pat. No. 4,370,908. This application Nov. 9, 1982, Ser. No. 440,418

Int. Cl.³ B23D *25/02*

U.S. Cl. 83—348 **7 Claims**



1. A cutting head for filter attachment machine comprising a drum carrying a plurality of radially-directed knives each of which is urged radially outwards by two springs at or near the opposite ends of the respective knife so that the knife is freely outwardly movable against a single adjustable retaining device which limits said outward movement and by which the normal distance of the cutting edge of the knife from the axis of the drum can be adjusted, said retaining device for each knife being positioned centrally between the two springs so as to permit pivotal movement of the knife with respect to the cutting head.

4,537,105

CIRCULAR CROSS-CUT AND MITER SAW BOX

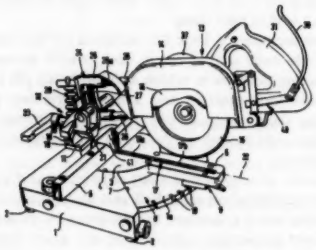
Otto Bergler, Mühlacker-Lomersheim, Fed. Rep. of Germany, assignor to Black & Decker Overseas AG, Vaduz, Liechtenstein

Filed Aug. 8, 1984, Ser. No. 638,694

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1983, 3329496

Int. Cl.³ B27B *5/20*

U.S. Cl. 83—471.3 **8 Claims**



1. A saw mechanism comprising:

a work support including a circular opening and a recess communicating radially with said opening,

a circular table rotatably carried in said circular opening of said work support and including an arm with an insertion slit projecting radially into said recess so as to be movable circumferentially within said recess, the circumferential extent of said recess corresponding to the range of the miter cut for the saw mechanism,

a pivot support carried by said table,

a guide means mounted on said pivot support for rotation about an axis extending generally transversely relative to said slit, said guide means including parallel rods projecting generally transversely relative to said axis, said rods lying in a common plane oriented perpendicularly to the plane of said table, and

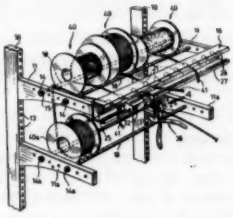
saw means comprising a saw housing and a motor driven blade rotatably carried by said saw housing for rotation about an axis, said saw housing having passages located directly therein which passages slidably receive said rods such that said saw housing can be adjusted relative to said table along said rods, said passages each disposed in the immediate vicinity of said axis of rotation of said blade and lying in a common plane oriented perpendicularly to said plane of said table in the immediate vicinity of the plane of said blade.

4,537,106

STAND FOR DISPENSING FILAMENTARY MATERIAL FROM REELS

Earle B. Rider, 80 Galaxy Blvd., Rexdale, Ontario, Canada (M9W 4Y8)

Filed Aug. 19, 1983, Ser. No. 524,539
Int. Cl.³ B65H *49/22*
U.S. Cl. 83—650 **1 Claim**



1. A display and dispensing rack for reels of filamentary material comprising;

a. an upright frame;

b. a pair of spaced, forwardly projecting arms carried by the frame;

c. a guide and cutter supporting bar joining the forward ends of the arms and provided with a plurality of spaced apertures through which the filamentary material is led from reels;

d. at least two spaced, parallel rods extending between the arms at locations behind the guide and cutter bar and in front of the frame and spaced apart by a distance that is less than the flange diameter of the smallest reel from which filamentary material is to be dispensed;

e. each of said rods carrying a plurality of closely spaced, separate, short rollers fully occupying the space between the arms and freely rotatable thereon, each short roller being provided with a radial flange adjacent at least one end.

4,537,107

APPARATUS FOR SEVERING STRAND

Gordon P. Armstrong, Newark; Martin C. Flautt, Granville, and Gary L. Williams, Newark, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

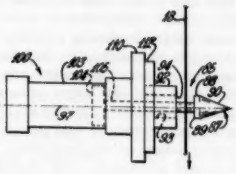
Filed May 24, 1984, Ser. No. 613,854
Int. Cl.³ B26D *1/02, 1/04*
U.S. Cl. 83—694 **4 Claims**

1. Apparatus for severing a strand comprising:

a cutting head linearly movable along an axis, the cutting head having a base section and a conical section, the base section having a cutting edge along the periphery thereof,

motive means for moving the cutting head between an extended position and a retracted position;

a die having a bore adapted to slidably receive the cutting head, the bore of the die having a cutting edge at the periphery thereof to cooperate with the cutting edge of the base section of the head to sever the strand as the



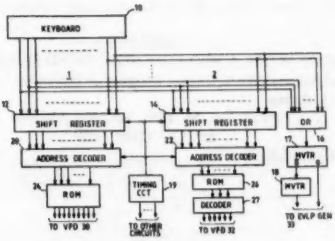
cutting head moves from the extended position to the retracted position within the casing, the conical section of the head being adapted to permit the strand to slide transversely over the cutting head into a region intermediate the head and die as the head is moved from the retracted position to the extended position.

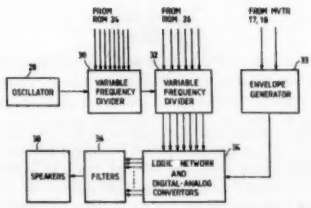
4,537,108

ELECTRONIC MUSICAL INSTRUMENT HAVING VARIABLE FREQUENCY DIVIDERS

Takami Shiramizu, Kanagawa, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed Mar. 29, 1983, Ser. No. 480,128
Claims priority, application Japan, Mar. 31, 1982, 57-51308
Int. Cl.³ G10H *1/00*
U.S. Cl. 84—1.01 **14 Claims**





1. An electronic musical instrument having a keyboard comprising:

code generating means responsive to the operation of each of the keys on said keyboard for generating a first code indicating a pitch tone and a second code indicating an octave associated with the operated key, said first code including an odd number signal and an even number signal respectively indicating that an integer by which the fre-

quency of said master clock pulses is divided is odd or even;

an oscillator for generating master clock pulses at a constant frequency;

a first variable frequency divider presettable to a first count value which is variable as a function of said first code for dividing the frequency of said master clock pulses by counting the same and generating a first divider output when said first count value is reached, said first variable frequency divider comprises:

first counter means including a series of interconnected counter stages presettable to said first count value for counting said master clock pulses and generating an output pulse when said first count value is reached;

second counter means for counting said master clock pulses upon a first occurrence of said output pulse for resetting said counter stages to said first count value when a first predetermined additional value is counted and upon a second occurrence of said output pulse for resetting said counter stages to said first count value when a second predetermined additional value is counted, there being a difference of one count between said first and second predetermined additional values in the presence of said odd number signal and there being no difference therebetween in the presence of said even number signal; and

bistable means responsive to said output pulse for generating said first divider output at a first voltage level in response to the first occurrence of said output pulse and at a second voltage level in response to the second occurrence of said output pulse;

a second variable frequency divider responsive to said first divider output and presettable to a second count value which is variable as a function of said second code for dividing ' the frequency of said first divider output by counting the same and generating a plurality of pulse trains having octave frequency relationship; and

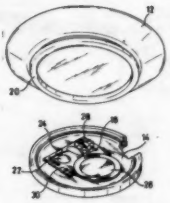
digital-to-analog converting means for converting said pulse trains into an analog signal.

4,537,109

DISH WITH A MELODY SOUNDING FUNCTION

Koichi Sakurai, Tara, Japan, assignor to Sakuraya Corporation, Tara, Japan

Filed Jan. 16, 1984, Ser. No. 570,906
Int. Cl.³ G10F *1/00*
U.S. Cl. 84—1.03 **4 Claims**



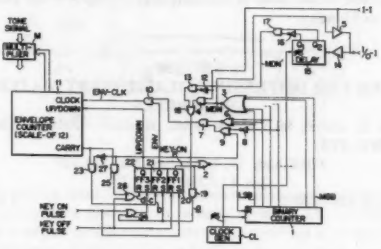
1. A dish having a melody sounding function and comprising a bottom wall of predetermined thickness and an annular wall outwardly flared from the bottom wall, at least said bottom wall for its entire extent being light permeable throughout its thickness and having an upper surface adapted to receive a light blocking object, a melody sounding means supported below said bottom wall of the dish in proximate relation to said bottom wall for producing a melody for a predetermined time, means for thus supporting the melody sounding means, and means forming part of the melody sounding means and comprising a photosensor normally exposed to light through the light permeable bottom wall of the dish for initiating production of a melody when said photosensor is impinged by light as occurs when the dish is free of the light blocking object, said melody supporting means comprising a plate mounted to the dish in relation to its bottom wall to define a space between the plate and the bottom wall in which space said melody sounding means is received.

4,537,110

ENVELOPE CONTROL APPARATUS

Keiichi Sakurai; Hideaki Ishida, and Kohtaro Hanzawa, all of Tokyo, Japan, assignors to Casio Computer Co., Tokyo, Japan

Filed Sep. 14, 1983, Ser. No. 532,504
Claims priority, application Japan, Sep. 20, 1982, 57-164518
Int. Cl.³ G10H *1/057*
U.S. Cl. 84—1.26 **13 Claims**



1. An envelope control apparatus comprising:

clock pulse generating means for generating clock pulses of a predetermined cycle in response to continued operation of a key;

envelope clock pulse counting means for counting clock pulses generated by said clock pulse generating means;

means for forming envelope waveform data defining a complete envelope waveform which varies in accordance with the count of said envelope clock pulse counting means; and

changing means for changing the state of said envelope clock pulse counting means to a counting state corresponding to an attack state of the envelope waveform when the clock pulses of said predetermined cycle are supplied from said clock pulse generating means to said changing means;

wherein new envelope waveform data defining a new complete envelope waveform is generated by said envelope waveform data forming means prior to formation of one envelope waveform.

4,537,111

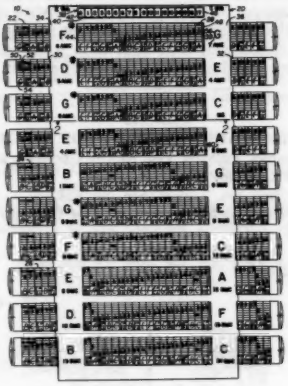
SYSTEM FOR AIDING NOTE TRANSPOSITIONS FOR STRINGED INSTRUMENTS

Joseph R. Heath, 884 Jeannette Ave., Baltimore, Md. 21222

Filed Aug. 19, 1983, Ser. No. 524,531
Int. Cl.³ G09B *15/02*
U.S. Cl. 84—473 **1 Claim**

1. In a system for aiding note transpositions for stringed instruments, said system having a frame, means on the frame slidably mounting in parallel a plurality of slides, the frame having means parallel with the slides for simulating a spaced succession of stringed instruments fret locations between first and second ends of said means for simulating, each slide having a succession of musical scale elements therealong on a spacing corresponding to the spacings of said means for simulating, the improvement comprising: first and second strips on the frame with each of said first and second strips overlying a portion of the plurality of slides, said first and second strips parallel-spaced a distance substantially aligning an edge of the first strip with the first end of the means for simulating and an edge of the second strip with the second end of the means for simulat-

ing; each of said first and second strips having thereon a succession of open string identifications spaced to coincide respectively with respective slides, each musical scale element including a measure corresponding in length to said spacing of the fret locations and in said measure a note on a scale and the name of said note, the entirety of each slide being visible except for said portion overlain by the first and second strips, each slide being freely slidable past the first strip and past the second strip, said frame comprising a unitary rectangular sheet, said



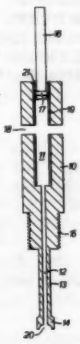
means slidably mounting comprising structure of said unitary rectangular sheet defining a plurality of rectangular windows parallel with each other between said first and second strips and further defining a respective slot outboard each rectangular window, said unitary rectangular sheet having first and second inwardly folded margins, each fold being medianly through a respective said slot, means for securing said inwardly folded margins and forming a flattened tube of said frame, and said rectangular windows and slots having substantially the same height as said slides.

4,537,112

CARTRIDGE DECAPPING TOOL

James T. Dabonde, P.O. Box 502, Gympie, Queensland, Australia

Filed Feb. 7, 1984, Ser. No. 577,678
Int. Cl.³ F42B *33/04, 33/10*
U.S. Cl. 86—37 **4 Claims**



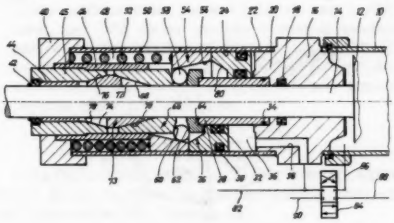
1. A Berdan primer cap removing tool for decapping a spent Berdan primed cartridge case, having flash hole means in the base thereof, to enable reloading of the cartridge case, comprising a tubular means for communicating at a first end thereof with the inside of the base of a cartridge to sealingly contact against said base and communicate pressurized fluid thereto from a source of said fluid, said tubular means first end being dimensioned to overlie said flash hole means, said first end of said tubular means being adapted to be sealingly held against said cartridge case base during decapping, the improvement comprising in that said source of pressurized fluid comprises a cylinder body and a piston reciprocably movable therein, means for feeding a working fluid within said cylinder body, said piston having a striking surface extending externally of said cylinder body which when struck acts on said working fluid to impulsively communicate pressurized fluid to the primer cap to be removed, said cylinder body being formed with a bore of predetermined size, said cylinder body having an axially extending cylindrical tubular part adapted to be received in the cartridge case and having a bore in communication with the bore in the cylindrical body, said tubular part having a diameter and bore size smaller than the diameter and bore size of the cylindrical body, said first end of the tubular means comprising the free end of the tubular part extension of the cylindrical body, said cylindrical body having a threaded portion adapted for threaded engagement with a standard shooter's device for sealingly engaging said first end of the tubular means with the cartridge base, said first end of the tubular means having resizing means for resizing the cartridge on removing the axially extending tubular part from the cartridge case after decapping thereof.

4,537,113

BRAKING DEVICE FOR A FLUID POWER ACTUATOR

Kurt Stoll, Lenzhalde 72, 7300 Esslingen, and Gerhard Hihn, Schurwaldstr. 7, 7300 Esslinge-Berkheim, both of Fed. Rep. of Germany

Filed Sep. 3, 1982, Ser. No. 414,681
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1981, 3136311
Int. Cl.³ F15B *15/26*
U.S. Cl. 92—24 **11 Claims**



1. A braking device for a fluid power actuator, comprising:
an elongate cylinder housing having at least one end wall with an opening extending axially therethrough;
a piston reciprocally mounted in said cylinder housing and having a piston rod extending through said opening;
an elongate brake housing fixedly connected to said cylinder housing with said piston rod extending into said brake housing;
a contractible brake ring mounted in said brake housing and encircling said piston rod and adapted to contract into braking engagment with said piston rod, said brake ring having at least one first inclined ramp surface thereon;
drive ring means mounted on said brake housing, said drive ring means having a second inclined ramp surface thereon conformed to the inclination of and adapted to engage said first ramp surface, said brake ring contracting into braking engagement with said piston rod in response to said first

and second ramp surfaces moving into engagement with each other;

guide means on said brake housing for guiding said drive ring means for reciprocal movement to thereby facilitate a movement of said first and second ramp surfaces into engagement with each other;

collar means fixedly mounted on said brake housing and encircling said piston rod and being axially spaced from said drive ring means on a side thereof remote from said brake ring;

means defining radially inwardly converging surfaces on the mutually facing ends of said drive ring means and said collar means;

plural ball elements received between and engaging said converging surfaces, a radially inward movement of said balls effecting an axial movement of said driving ring means and said ramp surface thereon into engagement with said ramp surface on the brake ring;

reciprocal brake freeing piston means mounted on said brake housing and having a third inclined ramp surface engaging said plural ball elements, a movement of said brake freeing piston in a first direction effecting a radially inward movement of said plural ball elements;

resilient means for continually urging said brake freeing piston means in said first direction; and

means for urging said brake freeing piston means in a second direction opposite said first direction and against the urging of said resilient means in response to a supply of pressurized fluid, whereby a failure of said supply of pressurized fluid will automatically cause said resilient means to bring said first and second ramp surfaces into engagement and a contracting of said brake ring into braking relation with said piston rod.

4,537,114

AIR CONDITIONING APPARATUS FOR CARS

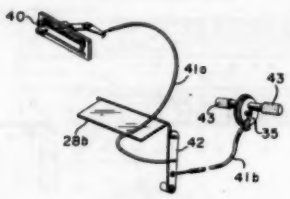
Katsura Izaki, Yaizu, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 15, 1984, Ser. No. 610,475

Claims priority, application Japan, Jun. 20, 1983, 58-110351

Int. Cl.³ B60H *3/00*

U.S. Cl. 98—2.06 **4 Claims**



1. An air conditioning apparatus for cars comprising:

an air intake fan having internal and external air inlet ports;

a heat exchanger for cooling and a heat exchanger for warming, both of said heat exchangers being arranged in series downstream of said intake fan and extending in a direction substantially perpendicular to the direction of the air flow;

and air mixing chamber formed downstream of said heat exchanger for warming, said air intake fan, said heat exchanger for cooling, said heat exchanger for warming and said air mixing chamber being all installed in order in one and the same casing, wherein the area of ventilation of said heat exchanger for warming is smaller than that of said heat exchanger for cooling;

a by-pass route formed in said casing; an air mixing damper positioned in said by-pass route, said air mixing damper having a pivot arm for opening and closing said air mixing damper; and

a warm water valve provided in said casing to regulate the flow rate of warm water supplied to said heat exchanger for warming,

wherein said warm water valve for regulating the flow rate of warm water is connected to said pivot arm through a first wire cable and a manual operating lever for temperature control is connected to said pivot arm through a second wire cable, said manual operating lever thereby operating both said warm water valve and said air mixing damper,

wherein said first and second cables are linked to said air mixing damper in such a manner that when said warm water valve is entirely opened, said air mixing damper is entirely closed and when said warm water valve is entirely closed, said air mixing damper is entirely opened.

4,537,115

VENTILATION ARRANGEMENT FOR A TAILGATE

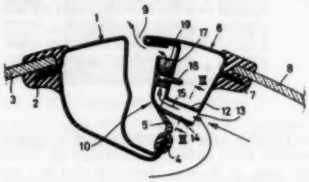
Hermann Haesters, Pulheim, Fed. Rep. of Germany, assignor to Ford Motor Company, Dearborn, Mich.

Filed Jun. 7, 1984, Ser. No. 618,284

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1983, 3326030

Int. Cl.³ B60H *1/24*

U.S. Cl. 98—2.18 **7 Claims**



1. A ventilation arrangement for a hinged motor vehicle tailgate, the arrangement having air-inlet openings disposed in the region of a tailgate frame member and air-outlet openings discharging into the gap between the tailgate and the surrounding opening in the bodywork of the motor vehicle, wherein portions of a tailgate frame member are provided with a recessed portion which extends along an edge of the frame member, there being disposed within the recessed portion an air-guiding insert of which the inner contour is shaped to fit within the recessed portion and of which the outer contour lies flush with unrecessed portion of the tailgate frame member and is engageable by a door seal.

4,537,116

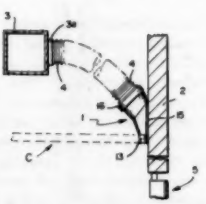
AIR DRAPE

Martin Nassof, 300 Winston Dr., Cliffside Park, N.J. 07010, assignor to Martin Nassof, Cliffside Park, N.J.

Filed May 25, 1984, Ser. No. 614,317

Int. Cl.³ F24F *9/00*

U.S. Cl. 98—36 **16 Claims**



1. Apparatus for producing an air curtain at the perimeter of a room defined by a vertical wall, which comprises a plurality of air curtain means for delivering a thin, downwardly flowing, fan-shaped flow of air mounted adjacent the interior and at

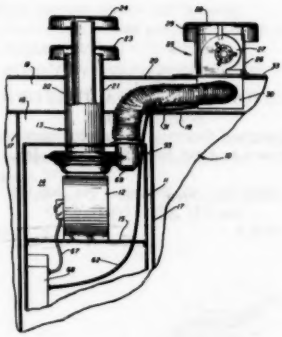
the top of the vertical wall defining the room and spaced apart by a distance such that the downwardly flowing, fan-shaped flow of air delivered by each said air curtain means overlaps the fan-shaped flow of air delivered by the next adjacent air curtain means; each said air curtain means having an elongated air inlet, a narrow, enlongated air outlet, said air outlet being longer and narrower than said air inlet, and wall means between said air inlet and air outlet defining a flow path for air flowing from said air inlet to said air outlet, said wall means having opposed wall portions connected between the ends of said air inlet and air outlet and diverging from said air inlet to said air outlet, said wall means further having a plurality of cross-sections along said flow path to provide a transition between said air inlet and air outlet, whereby said air curtain means is operable to provide said thin, fan-shaped flow.

4,537,117

FRESH AIR DEVICE FOR MOBILE HOME OR OTHER DWELLING

Adrian V. Cavestany, and Alan R. Zimmerman, both of Wichita, Kans., assignors to The Coleman Company, Inc., Wichita, Kans.

Filed Jan. 11, 1984, Ser. No. 569,919
Int. Cl.³ F24D *5/00*; F24F *7/00*
U.S. Cl. 98—39.1 **21 Claims**



1. A fresh air device for a dwelling equipped with a furnace having an air blower for supplying heated air to the dwelling, the dwelling having an attic, the fresh air device comprising:

a fresh air blower for drawing outside air into the dwelling,

air dividing means for diverting a first portion of the outside air to the attic and a second portion of the outside air to the furnace, and

duct means for conveying the second portion of the outside air to the furnace.

4,537,118

FLOW DISTRIBUTOR

Leif I. Lind, Burevägen 5, 182 63 Djursholm, Sweden

PCT No. PCT/SE82/00301, § 371 Date May 27, 1983, § 102(e) Date May 27, 1983, PCT Pub. No. WO83/01290, PCT Pub. Date Apr. 14, 1983
PCT Filed Sep. 29, 1982, Ser. No. 506,645
Claims priority, application Sweden, Sep. 30, 1981, 8105785
Int. Cl.³ F24F *13/06*
U.S. Cl. 98—40.01 **9 Claims**

1. A flow distributor for uniformly distributing fluid flow, said flow distributor comprising:

a wall;

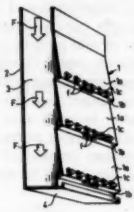
at least one further wall spaced from and extending parallel to said wall;

a chambr defined by said wall and said at least one further wall, said chamber adapted to receive flow of a fluid;

rows of perforations defined by said wall, each said row including at least one perforation;

profile sections defined by said wall extending into said chamber in a direction transverse to the flow of said fluid for deflecting the flow of said fluid from said chamber to said rows of perforations to divide said fluid into a plurality of uniform flow parts as the fluid flows from said chamber through said rows of perforations in a common direction transverse to the direction of the flow of said fluid and for strengthening said wall;

each profile section being located adjacent to one row of perforations in a downstream direction from said one row of perforations along the flow of said fluid, and a distance between an edge of each row of perforations and their respective adjacent profile section being less than 1/10 of the height of the respective adjacent row of perforations;



said profile sections being substantially planar and extending into said chamber in said direction transverse to the direction of the flow of said fluid, substantially along the width of said wall;

the width of said profile sections extending into said chamber in said direction transverse to the direction of the flow of said fluid being at least equal to the height of the respective adjacent row of perforations; and

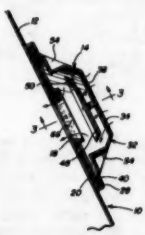
planar sections defined by said wall, each of said planar sections including one of said rows of perforations, said planar sections being located between said profile sections, and said planar sections extending substantially parallel to the direction of flow of said fluid to form a stepped arrangement with said profile sections and the area of the planar sections being substantially greater than the area of the profile sections.

4,537,119

WEATHER PROTECTIVE COVER VENTILATOR

Frank R. Jarnot, Lantana, Fla., assignor to Airlette Manufacturing Corporation, Inc., Lantana, Fla.

Filed May 8, 1984, Ser. No. 608,170
Int. Cl.³ F24F *7/00*
U.S. Cl. 98—52 **13 Claims**



1. A ventilator for a panel having a vent opening formed

therethrough, said ventilator including a generally annular panel-like base for overlying and anchoring to one side of said panel, said base having a central opening therein and defining first and second remote sides with said first side of said base adapted to be mounted in at least reasonably good fluid tight sealed engagement with the portions of said panel extending about the vent opening formed in said panel, a cup-shaped cover defining a closed end, an open end and peripheral wall means extending about said closed end and between said closed end and said open end, said cover being constructed of a material rendering said cover shape retentive, but flexible and resilient to an extent that predetermined remote portions of said peripheral wall means, adjacent said open end, may be manually deflected inwardly and thereafter released for inherent return to non-inwardly deflected positions, said open end of said cover opposing and opening toward said second side of said base, said base and predetermined remote portions of said peripheral wall means including coacting anchor structure interlockingly engageable with each other upon return of said inwardly deflected portions of said wall means to their non-inwardly deflected positions, said cover including ventilation openings formed in said closed end, said coacting anchor structure including first radially outwardly projecting flanges carried by remote portions of said peripheral wall means adjacent said open end and second angle flanges carried by remote portions of said base and projecting outwardly from said second side and toward each other, said first flanges being removably captively receivable beneath said second flanges upon inward deflection of said remote portions of said peripheral wall means and subsequent release of said peripheral wall means remote portions for return to non-inwardly deflected positions.

4,537,120

SURFACE TREATMENT PLANT AND A METHOD OF VENTILATING SAME

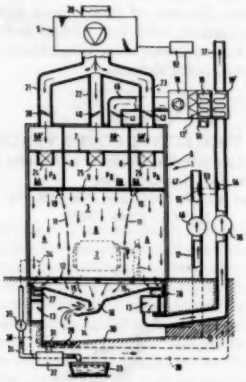
Leif Josefsson, Torpsbruk, Sweden, assignor to Flakt Aktiebolag, Nacka, Sweden

Filed Apr. 20, 1983, Ser. No. 486,736

Claims priority, application United Kingdom, Apr. 30, 1982, 8212649

Int. Cl.³ F24F *11/00*

U.S. Cl. 98—115.2 **11 Claims**



1. A paint spray booth having an enclosure in which spray painting is effected, said enclosure having a ceiling providing a plenum chamber above said ceiling, openings through /said ceiling admitting ventilating air into said enclosure from said chamber, and partition means dividing said chamber into passageways and into the enclosure, said enclosure having a floor underlying said ceiling with a plurality of air exit means associated therewith, means adjacent the partition means to provide at least one curtain of air to partition the enclosure into at least two separate zones extending over at least part of the enclosure, said curtain extending from the ceiling adjacent said /partition means to the floor whereby each zone is supplied with air from a separate passageway, the air in one zone being polluted differently than the air in the other zone, a first of said plurality of exit means being at one side of said curtain to receive air from said one zone, a second of said plurality of exit means being at the other side of said curtain to receive air from said other zone, the ventilating air passing through each zone of the enclosure entraining the pollutant in said zone, a first separator means having a first fan means communicating with said first air exit means of the floor for receiving the ventilating air discharged from said one zone and adapted to separate the air and the pollutant discharged from that zone, and a second separator means having a second fan means communicating with said second exit means for receiving the ventilation air discharged from the other zone and adapted to separate the air and the pollutant discharged from that zone, said one zone being more heavily polluted with paint particles than the other zone, the first separator means being a wet separator and the second separator means being a dry separator.

4,537,121

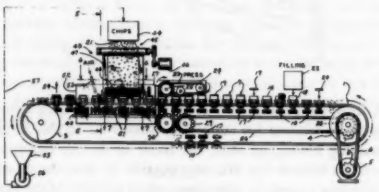
APPARATUS FOR THE MANUFACTURE OF ICE CREAM SANDWICHES

Vernon L. Bero, and Fredrick W. Schultz, both of Green Bay, Wis., assignors to Gold Band Ice Cream, Inc., Green Bay, Wis.

Filed Apr. 30, 1984, Ser. No. 605,101

Int. Cl.³ A21C *9/04, 15/00*

U.S. Cl. 99—450.4 **17 Claims**



1. In a machine for manufacturing ice cream sandwiches, the initial components of which include a layer of ice cream or the like sandwiched between upper and lower cookies or the like, the combination comprising:

(a) a conveyor belt having an upstream portion and a downstream portion,

(b) motive means to drive said belt along a path,

(c) a plurality of carrier assemblies disposed along and carried by said belt and with said assemblies being adapted to receive in succession the individual components of said sandwiches at said upstream belt portion,

(d) drive means disposed downstream of said upstream portion of said belt to rotate said assemblies and the sandwiches thereon about a vertical axis,

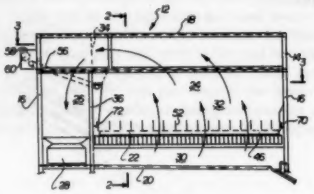
(e) spraying means disposed adjacent said belt to spray chips onto the rotating sandwiches so that chips adhere thereto,

(f) and means disposed downstream of said chip spraying means to remove stray chips from the upper cookie of said the sprayed sandwiches.

4,537,122
SKIN REMOVAL APPARATUS FOR ALMONDS

Kurudamannil A. George, Levittown, Pa., assignor to Proctor & Schwartz, Inc., Horsham, Pa.

Division of Ser. No. 438,279, Nov. 1, 1982, Pat. No. 4,491,603.
This application Sep. 24, 1984, Ser. No. 653,638
Int. Cl.³ A23N *5/08*
U.S. Cl. 99—516 **10 Claims**

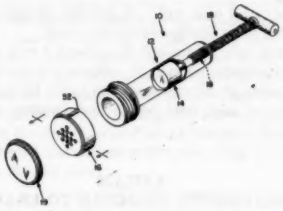


1. Apparatus for removing skins from edible nuts comprising
means for presoaking said nuts in a liquid to loosen the skins;
means for washing the soaked nuts to remove a majority of said skins from the nuts, said nuts after washing having remaining skins;
means for predrying said nuts in an amount effective to remove superficial water from the nuts;
a housing;
a foraminous support within said housing;
means to form a bed of said predried nuts on said support;
means to fluidize said bed with air; and
means to separate the skins entrained in the air from such air.

4,537,123
DEVICE FOR PRESSING GARLIC AND THE LIKE

David A. Holcomb, Seattle, Wash., assignor to F & H Holdings, Inc., Bellevue, Wash.

Filed Sep. 27, 1982, Ser. No. 424,838
Int. Cl.³ B30B *1/20*
U.S. Cl. 100—125 **4 Claims**

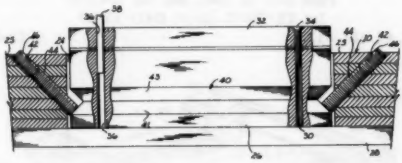


1. Device for extruding garlic cloves and the like, comprising:
(a) an integrally formed elongated cylindrically tubular transparent plastic body having a cylinder wall and also having a closed end and an open end, said closed end having an inwardly extending central stem support portion of predetermined greater thickness than said cylinder wall and including generally axially disposed internal threads for receiving a threaded stem member, the open end of said body having external threads for receiving a threaded end piece, said body defining therein a storage cavity,
(b) a shallow, cylindrical, cup-shaped plastic end piece having an integral side wall and bottom wall and also having internal threads on said side wall for threadably engaging the external threads on the open end of said body, and further including a plurality of openings in said bottom wall, said end piece having an annular, radially inwardly offset closure cap engaging surface around the outside of said bottom wall,
(c) a cylindrically shaped plastic piston member slidable within said body and shaped to present a generally flat round surface facing toward the open end of said body and designed to be engaged by a piston stem,
(d) an elongated plastic threaded stem member for being receiving at said closed end of said body through said internal threads and having an inner end which coactingly engages said piston member within said body and which extends out of said closed end and has an outer end to which is attached a handle means for threading said stem member in and out as required, and
(e) a plastic closure cap means for engaging said closure cap engaging surface on said end piece for enclosing the interior of said device and preventing the escape of odors from food contained within said storage cavity.

4,537,124
EMBOSSER MOUNTING INSERT REGISTERING MEANS

Herman A. Graboyes, Mishawaka, Ind., assignor to Atlas Steel Rule Die, Inc., Elkhart, Ind.

Filed Jan. 30, 1984, Ser. No. 574,716
Int. Cl.³ B44B *5/02;* **B31F** *1/07*
U.S. Cl. 101—28 **1 Claim**



1. In combination, a steel rule die and an adjustable embosser comprising a mounting insert carrying said embosser, said die having an opening herein, said die including knives circumscribing said die opening, said insert fitted into said die opening with clearance to permit lateral movement of the insert relative to the die, threaded bores formed in said die in communication with said die opening at opposite sides of the opening, adjustment screws turned into said die bores and contacting said insert such that axial movement of said screws is translated into said lateral movement of said insert to position said embosser relative to said die, said insert having a peripheral groove, said peripheral groove being V-shaped and having upper and lower surfaces, said adjustment screws abutting the lower surface of said peripheral groove for laterally moving said block to position said embosser relative to said die, said upper surface of said peripheral groove constituting means for contacting said adjustment screws to prevent separation of said insert from said die.

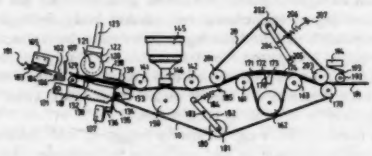
4,537,125
ENDLESS DRIVE BELT APPARATUS FOR PROCESSING CARD TICKETS WITH MAGNETIC TRACK

Michel M. G. Gaucher, Le Mesnil Saint Denis, France, assignor to Electronique Serge Dassault, Paris, France

Filed Jun. 25, 1984, Ser. No. 623,959
Claims priority, application France, Jul. 8, 1983, 83 11444
Int. Cl.³ B41J *3/00*
U.S. Cl. 101—93.04 **10 Claims**

1. Card ticket processing apparatus including conveyor means for conveying a ticket along a path internal to the apparatus between a ticket inlet and a ticket outlet, and a print station at a first point along the said path for printing on the ticket, said conveyor means including an endless drive belt running round a circuit defined by guide wheels, the improvement wherein said belt is serrated and co-operates with each

ticket over a fraction of the width of the ticket, and said print station co-operates with a smooth platen roller located at said first point along the said path; said smooth roller having a notched portion over which said belt passes, the notched portion being of such a depth that the ticket-contacting surface of



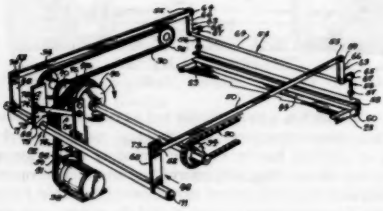
the belt is level with the rest of the cylindrical surface of the smooth roller where the belt passes over the roller; said print station being movable transversely relative to the belt to enable it to print on a ticket which is backed by a continuous platen surface which is constituted partly by the smooth roller and partly by the belt where it is level with the roller.

4,537,126

AUTOMATIC PEEL CONTROL MECHANISM

Henry J. Bubley, Deerfield, Ill., assignor to American Screen Printing Equipment Co., Chicago, Ill.

Filed Oct. 26, 1982, Ser. No. 436,679
Int. Cl.³ B41L *13/16;* B41F *15/08*
U.S. Cl. 101—123 **5 Claims**



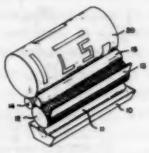
1. In a screen printing press, the combination of:
a press frame,
a screen,
a screen frame supporting the screen,
a printing bed fixed to the press frame for supporting the screen frame and a sheet of stock during printing,
a squeegee which slides across an upper surface of the screen during printing,
a traveling carriage which transports the squeegee in reciprocating motion between a front end and a rear end of the screen during a printing cycle,
carriage driving means for imparting the reciprocating motion to the carriage,
a printing head mounted on the press frame to support the carriage and screen frame, and
an automatic peel control mechanism which raises a front end of the screen frame at a controlled rate during a printing cycle, the automatic peel control mechanism comprising:
a rotatable cam means,
means for rotating the cam means in timed relation to the travel of the carriage, extending means extending from the cam means to the front end of the screen frame and extending along the sides of the printing head,
lever means driven by said cam means to operate said extending means to lift the front end of the screen, and
adjusting means associated with said lever means to change simultaneously an initial off contact position for the screen and a rate of peel for the screen.

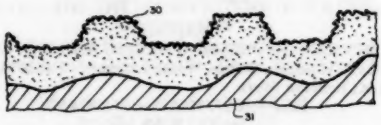
4,537,127

BLACK OXIDE LITHOGRAPHIC INK METERING ROLLER

Thomas A. Fadner, LaGrange, and Stanley H. Hycner, Bartlett, both of Ill., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Sep. 12, 1984, Ser. No. 649,773
Int. Cl.³ B41F *1/46, 31/26*
U.S. Cl. 101—141 **8 Claims**





1. An ink metering roller for use in lithographic printing comprising:
a. an engraved base roller of suitable diameter and length, selected from nitride-hardenable steel;
b. an outer zone of not less than about 3 mils thickness that is nitride-hardened to an R_c value of not less than about 55;
c. an outermost microporous iron oxide layer on said outer surface of said steel roller that consists essentially of Fe_3O_4.

4,537,128

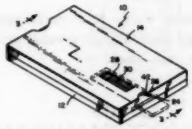
HAND PRINTER DESIGNED TO ENABLE A HANDICAPPED PERSON TO APPLY A SIGNATURE TO A DOCUMENT

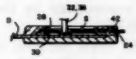
Robert H. Burroughs, Brookline, Mass.; John D. Wright, Sandown, N.H.; Jeffrey A. Secunda, Sharon, and Ronald S. Newbower, Acton, both of Mass., assignors to Massachusetts General Hospital, Boston, Mass.

Filed Oct. 20, 1983, Ser. No. 543,609
Int. Cl.³ B41K *1/00, 1/48;* B41F *1/28*
U.S. Cl. 101—407 BP **3 Claims**

1. Structure designed to enable a handicapped person to apply his signature or other identifying mark to a predetermined area of a document with the aid of a finger ring bearing an embossment of the signature or other identifying mark of the person, comprising, in combination, a holder for receiving the document and a finger ring bearing the signature or other identifying mark of the person, said holder embodying a bottom part defining a substantially rectangular recess of such area and depth as to receive the document to be signed, said recess being open at one end to enable inserting a document therein and closed at the other, a top part coextensive in area

with the bottom part containing substantially rectangular openings, one above the other, in the area thereof above the area of the document to be signed, so positioned relative to the closed end of the recess of the bottom part that when a document is inserted into the recess in the bottom part between the parts in engagement with the closed end of the recess in the bottom part, the area of the document to be signed will be aligned with the upper one of said openings in the top part, the lower one of the openings in the top part being larger in area than the upper one of the openings and said lower one of said openings being closed at the end proximate the open end of the recess in the bottom part and open at the end remote therefrom for receiving transfer paper, a retainer plate constituting a spacer recessed into the top part below the lower one of the openings therein, said spacer defining an opening corresponding in area to the area of the upper one of the openings in the





top part and being centered with respect thereto, said spacer further defining a supporting surface for supporting the transfer sheet in spaced, parallel relation to the document in the recess in the bottom part, said upper one of the openings in the top part and the opening in the spacer being of an area commensurate with the signature or other identifying mark to be applied to the document situated in the recess in the bottom part, said openings being of a size to enable inserting the embossment of the signature bearing ring through the openings in the top part and the opening in the spacer into engagement with the transfer sheet located in the recess in the bottom part and arcuate reentrant notches at the opposite ends of the top part centered on the longitudinal center lines of the recess in the bottom part and the openings in the top part providing access to the document located in the recess in the bottom part and access to the transfer sheet located in the lower one of the openings in the top part.

4,537,129

OFFSET PRINTING BLANKET

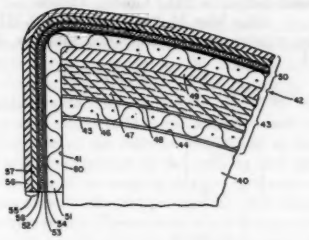
Frederick F. Heinemann, Canton, and Thomas O. Gavin, Harvard, both of Mass., assignors to W. R. Grace & Co., Cambridge, Mass.

Division of Ser. No. 172,055, Jul. 25, 1980, Pat. No. 4,452,143. This application Mar. 5, 1984, Ser. No. 586,157

Int. Cl.³ B41N *9/00*

U.S. Cl. 101—415.1 **5 Claims**

1. A printing element attached to a printing cylinder having a lock-up gap comprising a compressible printing element attached to the cylinder, the compressible printing element having a first and second edge, the first edge being substantially flush with a first edge of the lock-up gap and the second edge being substantially flush with a second edge of the lock-up gap, a non-compressible printing element having a first and second end portion, the first end portion directly engaging the first edge of the compressible printing element and extending into the lock-up gap, the second end portion directly engaging the second edge of the compressible printing element and extending into the lock-up gap, a portion of the non-compressible printing element, intermediate the first and second end portions, overlaying and directly engaging the compressible



printing element and the non-compressible printing element being secured to the cylinder at its first and second end portions by a lock-up means in the lock-up gap.

4,537,130

STRIPPER FOR A ROLLER CLEANING DEVICE

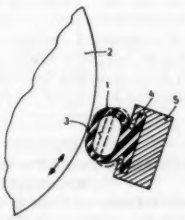
Klaus Theilacker, Friedberg, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Mar. 12, 1984, Ser. No. 588,664

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1983, 3309557

Int. Cl.³ B41F *35/04*

U.S. Cl. 101—425 **15 Claims**



1. In combination with a printing machine having a roller (2, 8), the surface of which is to be cleaned or stripped,

a stripping device for cleaning said roller (2, 8) comprising, in accordance with the invention,

a support rail (5, 7) extending axially parallel to the roller (2, 8) to be cleaned;

and a pressure hose (1, 6) secured to the rail with a surface thereof remote from the roller (2, 9) and extending axially along the roller, the pressure hose being expandable in cross section upon pressurization with a pressure fluid, and thereby engageable with the facing surface of the roller at a pressure which is essentially uniform over the axial length of the roller.

4,537,131
APPARATUS FOR INITIATING EXPLOSIONS AND METHOD THEREFOR

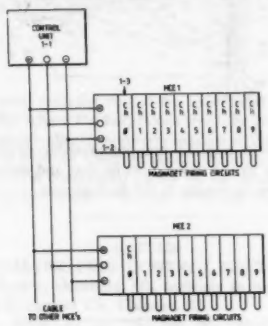
Peter J. Saunders, Dundonald, Scotland, assignor to Imperial Chemical Industries PLC, London, England

Filed May 23, 1983, Ser. No. 497,222

Claims priority, application United Kingdom, Jun. 3, 1982, 8216211

Int. Cl.³ F42C *11/06*

U.S. Cl. 102—217 **17 Claims**



1. An apparatus for initiating explosions by providing an electrical firing current in a plurality of detonator circuits connected thereto, said apparatus comprising:

a control unit locatable remote from the detonator circuits,

at least one multi-channel exploder (MCE) connected to said control unit and having a plurality of channels, each channel being provided with output means for connection to one of the detonator circuits,

each MCE comprising energy storage means for receiving and storing electrical energy provided by the control unit, means for testing the impedance of the detonator circuit connected to each channel thereby to detect whether the circuit is complete or broken, and firing means responsive to a firing signal from the control unit for converting at least a portion of the energy storage means into a firing current in each channel at a predetermined time interval after receipt of the firing signal;

and the control unit comprising an energy source from which to provide the electrical energy requirements of all the MCEs connected thereto, means for interrogating each MCE to determine whether or not all of the MCE's channels have complete detonator circuits, and a firing signal generator to activate the firing means in the MCEs.

4,537,132
HOLLOW-CHARGE INSERT FOR ARMOR-PIERCING PROJECTILE

Udo Sabranski, Willich, and Hans Orth, Ratingen, both of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Dusseldorf, Fed. Rep. of Germany

Filed Jun. 19, 1978, Ser. No. 920,621

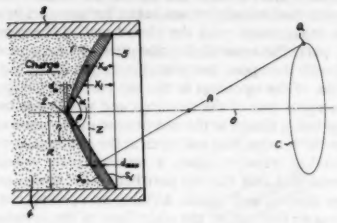
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1977, 27295176

Int. Cl.³ F42B *1/02*

U.S. Cl. 102—307 **8 Claims**

1. In an armor-piercing projectile having a casing with a substantially cylindrical wall portion, an insert of generally hollow-frustoconical shape in said casing with a rearwardly facing point on the axis of said wall portion and a forwardly facing base adjoining said wall portion, and a charge behind said insert in said casing,

the improvement wherein said insert has an inner peripheral surface of conical shape with an obtuse vertex angle and straight-line generatrices and an outer peripheral surface of generally conical shape whose axial distance from said inner surface progressively from a minimum value at said



point to a maximum value in a predetermined annular zone and thereafter decreases to a value greater than said minimum value at said base.

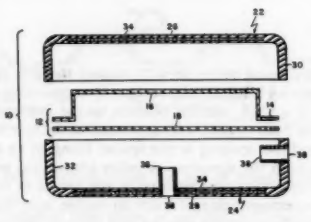
4,537,133
NON-INCENDIVE ROCK-BREAKING EXPLOSIVE CHARGE

Richard J. Mainiero, Pittsburgh, Pa., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Mar. 31, 1983, Ser. No. 480,793

Int. Cl.³ F42B *3/00*

U.S. Cl. 102—316 **24 Claims**



1. A non-incendive explosives charge comprising:

explosive means sheathed in a layer of flame quenching material surrounding said explosive means; and

squat housing means formed of a rubbery material enclosing said explosive means and said flame quenching material, said housing means having a pair of substantially planar surfaces separated by a transverse peripheral surface having a height smaller than the smallest dimension of said planar surfaces.

4,537,134
SELF-PROPELLING PROJECTILE FOR FIREARMS

Giovanni Galluzzi, Lecco, Italy, assignor to Giulio Fiocchi S.p.A., Lecco, Italy

Continuation of Ser. No. 438,308, Nov. 1, 1982, abandoned, which is a division of Ser. No. 147,878, May 8, 1980, Pat. No. 4,356,769, which is a division of Ser. No. 934,606, Aug. 17, 1978, Pat. No. 4,236,451, which is a continuation of Ser. No. 816,915, Jul. 19, 1977, abandoned, which is a continuation of Ser. No. 626,352, Oct. 28, 1975, abandoned, which is a division of Ser. No. 450,305, Mar. 12, 1974, Pat. No. 3,916,793. This application Jan. 29, 1985, Ser. No. 696,844

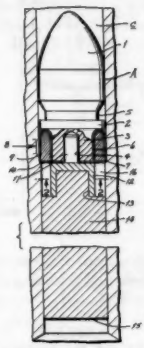
Claims priority, application Italy, May 31, 1971, 25246 A/71; Nov. 30, 1971, 31868 A/71

Int. Cl.³ F42B *5/26*

U.S. Cl. 102—380 **3 Claims**

1. A self-propelling, side-firing projectile comprising a pro-

jectile body, said body being of general bullet-like character of ogival contour, said body having a base, a cylindrical tang projecting rearwardly from said base, said tang being diametrally reduced with respect to the base of said projectile body for presenting an annular laterally opening recess, a cylindrical member extending rearwardly from said projectile body to a point remote from said tang and being closed at it's forward end and open at it's rearward end, a propellant charge provided within said cylindrical member and extending rearwardly therefrom, said tang having a socket, there being a disc disintegratable upon ignition, said disc constituting the rear-



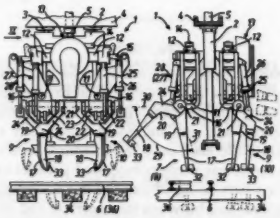
ward end of said laterally opening recess for defining thereby a compartment, a priming mixture received in said compartment, the closed end of said member being disposed between said disc and said propellant charge, a plug provided on said closed end of said member and extending through said case-forming for reception within said tang socket, said case-forming member having an outer wall defining exterior of said priming mixture compartment, said outer wall portion being adapted for transmission of percussion impinged thereon to said priming mixture for causing ignition of said priming mixture and disintegration of said disc whereby combustionof said propellant charge is effected upon disintegration of said disc.

4,537,135

TAMPING UNIT

Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen Industriegesellschaft m.b.H., Vienna, Austria

Filed Jan. 30, 1984, Ser. No. 575,059
Claims priority, application Austria, May 4, 1983, 1648/83
Int. Cl.³ E01B *27/16*
U.S. Cl. 104—12 **9 Claims**



1. A tamping unit for a track working machine mounted for mobility on a track comprised of two rails fastened to a succession of ties resting on ballast, which comprises

(a) a vertically adjustable tamping tool means carrier,

(b) a pair of vibratory tamping tool means arranged to straddle a respective one of the ties and mounted on the carrier for reciprocation in a direction towards and away from the one tie, each of the tamping tool means on each rail side including

(1) a tamping tool means holder constituted by a pivotal lever, the tamping tool means holder having an upper end and a lower end, and the holder being pivotal in said direction about a fulcrum extending perpendicularly to said direction intermediate the tamping tool holder ends,

(2) a power drive connected to the tamping tool means holder for pivoting the holder in said direction,

(3) two side-by-side tamping picks mounted on the lower tamping tool means holder end adjacent each side of a respective one of the rails for immersion in the ballast upon vertical adjustment of the tamping tool means carrier, a first one of the tamping picks on each side of the one rail being closer to the one rail than the other tamping pick and the two tamping picks on each side being mounted for independent pivoting in a plane extending perpendicularly to the direction of reciprocation between an operating position wherein the picks extend substantially vertically for immersion in the ballast and an inoperative position wherein the picks extend substantially horizontally above the track, and

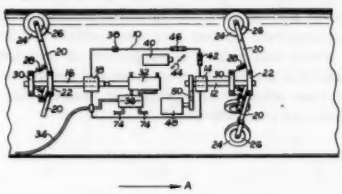
(4) separate power drives for pivoting the two tamping picks on each side independently of each other.

4,537,136

PIPELINE VEHICLE

Brian Douglas, Dunfermline, England, assignor to Subscan Systems Ltd., Great Britain

Filed Jan. 25, 1983, Ser. No. 460,788
Claims priority, application United Kingdom, Feb. 2, 1982, 8202978
Int. Cl.³ B61B *13/10*
U.S. Cl. 104—138 G **5 Claims**



1. A pipeline vehicle comprising a body, forward and rear wall engaging means carried by the body and alternately operable to grip the wall of a pipe, and reciprocable power means operable to extend and retract the wall engaging means relative to each other in synchronism with gripping of the wall so as to cause the vehicle to advance stepwise; and in which each wall engaging means comprises a plurality of wheels biased towards the wall for engagement therewith to support the vehicle, and each wheel is provided with braking means operating in synchronism with the reciprocable power means to cause the wheels of one wall engaging means to grip the wall while the wheels of the other wall engaging means are free to roll on the wall.

4,537,137

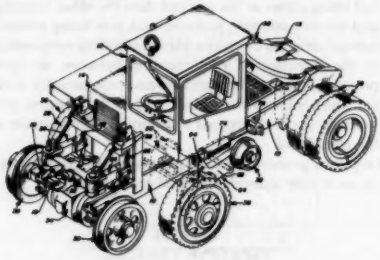
COMBINATION RAILCAR MOVING VEHICLE AND TRAILER SPOTTER

Eugene B. White, Jr., Park Forest, Ill., assignor to White Machinery Corporation, Joliet, Ill.

Filed Mar. 1, 1982, Ser. No. 353,842
Int. Cl.³ B61C *11/00*
U.S. Cl. 105—26 R **14 Claims**

1. In a railcar moving vehicle having a coupler for coupling with a railcar when driving on rail, the improvement compris-

ing, in combination, four steel wheels for supporting the vehicle on rail, four road wheels for supporting the vehicle on the ground, two of said steel wheels and two of said road wheels being movable between operative and inoperative positions, means for actuating said two movable steel wheels into lowered operative positions causing said vehicle to be supported on said four steel wheels with said four road wheels raised and for alternately actuating said two movable road wheels into lowered operative positions causing said vehicle to be supported on said four road wheels with said four steel wheels raised, two of said four steel wheels being driven and the other two steel wheels being free-wheeling, two of said road wheels being driven and the other two of said road wheels being



free-wheeling, common drive means for driving the driven steel and road wheels, one free-wheeling steel wheel and one free-wheeling road wheel on one side of said vehicle being mounted on first common pivot arm means, and a second free-wheeling steel wheel and a second free-wheeling road wheel on the other side of said vehicle being mounted on second common pivot arm means, and said means for actuating comprising means for simultaneously pivoting said first and second pivot arm means between a first position where said vehicle is supported on said four steel wheels and a second position where said vehicle is supported on said four road wheels, said first and second pivot arms and the free-wheeling steel and road wheels being positioned between the driven steel wheels and road wheels.

4,537,138

RADIAL TRUCKS

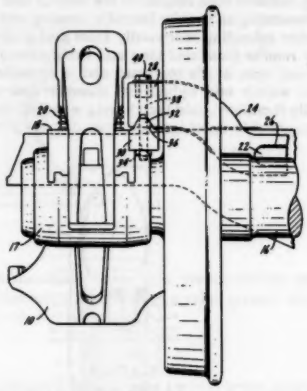
Robert L. Bullock, Lombard, Ill., assignor to Standard Car Truck Company, Park Ridge, Ill.

Filed Jul. 5, 1983, Ser. No. 510,764

Int. Cl.³ B61F *3/08, 5/38, 5/00*

U.S. Cl. 105—168 **3 Claims**

1. A railroad truck including a pair of side frames with wheeled axles mounted therebetween, a roller bearing adaptor mounted upon each end of each axle with side frames being mounted upon the adaptors, a subframe for connecting opposite corner adaptors, and a rigid connection between each adaptor and the subframe, each rigid connection including an adaptor portion and a subframe portion, said adaptor and subframe portions being relatively vertically disposed and having interlocking parts with slanted walls, and vertical fastening means for connecting said vertically disposed portions extending symmetrically through said interlocking parts, said



interlocking parts with slanted walls substantially reduce horizontal shear forces upon said fastening means.

4,537,139

GRATE OF INCINERATOR

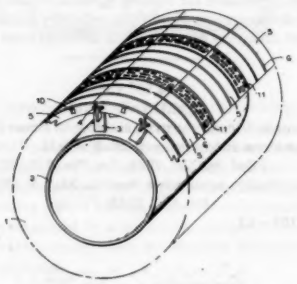
Anton Esser, Kaarst, Fed. Rep. of Germany, assignor to Deutsche Babcock Anlagen Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed May 3, 1984, Ser. No. 608,022

Claims priority, application Fed. Rep. of Germany, May 5, 1983, 3316363

Int. Cl.³ F23K *3/18*

U.S. Cl. 110—276 **8 Claims**



1. In a refuse-supporting grate of an incinerator, comprising a plurality of hollow rotary cylindrical drums each having an outer peripheral surface receiving refuse thereon, each drum having a central axis and including a plurality of grate bars extended parallel to each other and forming said outer peripheral surface, grate bar carriers extended parallel to said central axis, said grate bars being suspended in the direction transversal to said central axis between said carriers and on the latter so that between each two adjacent grate bars air slots are formed, each grate bar including a head portion having two side faces which are straight-line and smooth, the improvement comprising spaces between said grate bars, said grate bars each further including a foot portion having two opposite lateral faces, said spacers being positioned in pairs between the one lateral face of one grate bar and the lateral face of the adjacent grate bar, facing towards said one lateral face, the spacers in each pair

having abutting surfaces abutting against each other, said abutting surfaces being flat and smooth, each of said suspended grate bars having two opposite recesses and two extended portions above said recesses, said bar carriers being partially inserted in said recesses, each bar carrier being inserted into an assigned recess so that the play occurs between the respective extended portion of the suspended grate bar and the respective bar carrier at operation temperature.

4,537,140

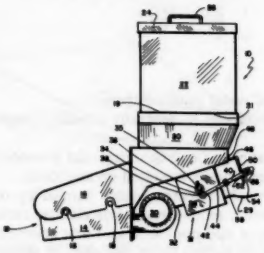
AUTOMATIC COAL STOVE STOKER

Charles M. Baker, Box 2076, R.D. #2, Orwigsburg, Pa. 17961

Filed Jul. 2, 1984, Ser. No. 626,888

Int. Cl.³ F23N *7/08*

U.S. Cl. 110—281 **14 Claims**



1. In a coal stoker including a hopper with a lower forward passage, a base box forming an ash pit, a ramp, said ramp including a fire grate proximate the lower two-thirds of said ramp and a plate proximate the higher one-third of said ramp with the plate extending generally through said hopper's bottom and a motor including a shaft, the improvement comprising:

(a) a linear reciprocating carpet overlying at least generally the length and width of said plate; said carpet operatively connected to said motor by eccentric movement means, said means including:

(i) a housing including two aligned sleeves, one said sleeve overfitting said motor shaft, said housing's second sleeve adapted to receive

(ii) one end of a J-shaped rod, said rod's other end being operatively connected to said movable carpet,

so that when said motor is activated by said power source, said motor shaft's 360 degree revolution causes said second sleeve to rotate, thereby moving said rod in its stroke so that

coal falling on said carpet from said hopper will continually advance from said carpet's leading edge onto said grate in an even flow.

4,537,141

COMBUSTION CHAMBER FOR SOLID FUELS

Ernst Brunner, Mümliswil, Switzerland, assignor to TIBA AG Kochherdfabrik und Apparatebau, Bubendorf, Switzerland

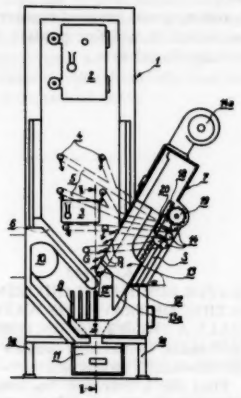
Filed Jun. 6, 1984, Ser. No. 617,734

Claims priority, application Switzerland, Jun. 8, 1983, 3144/83

Int. Cl.³ F23N *3/00*

U.S. Cl. 110—300 **8 Claims**

1. A combination chamber for solid fuels, with a housing, a closable charging orifice located in its top part, a grate arranged in the lower portion of the housing, and a number of primary-air orifices directed into the furnace and connected to a compressed-air source, wherein the grate is designed as an air feeder and has an arrangement of hollow profiles which are connected to said compressed-air source and which are arranged at a distance from one another forming gaps and are provided with a number of air outflow orifices, a covering slide means being mounted in the region of the grate so as to be displaceable relative to the latter, in such a way that it more or



less covers or completely exposes the gaps between the hollow profiles, depending on its position.

4,537,142

SHUTTLE STOPPER FOR LOCK STITCH SEWING MACHINE

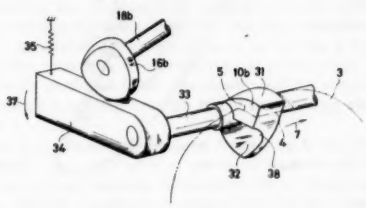
Tokuzo Hirose, Hyogo, Japan, assignor to Hirose Manufacturing Co., Ltd.,, Osaka, Japan

Filed Sep. 22, 1983, Ser. No. 534,624

Claims priority, application Japan, May 14, 1983, 58-84756

Int. Cl.³ D05B *57/08, 57/26*

U.S. Cl. 112—231 **4 Claims**



1. In a lock stitch sewing machine of the type including a rotating loop taker, a bobbin case adjacent said loop taker, said bobbin case having therein a recess defining a first contacting face, and a stopper device for preventing rotation of said bobbin case with said loop taker, said stopper device including a retaining member extending into said recess and having a second contacting face contacting said first contacting face, the improvement of means for allowing a thread loop to pass between said first and second contacting faces without allowing substantial collision therebetween, said means comprising:

a third contacting face formed by a recess extending concavely into said retaining member in a downstream direction with respect to the direction of rotation of said loop taker, said third contacting face being joined to said second contacting face by a communicating surface curving smoothly from and third contacting face in an upstream direction;

means for moving said retaining member within said recess in said bobbin case from a first position, whereat said second contacting face abuts said first contacting face to prevent rotation of said bobbin case, to a second position,

whereat said third contacting face confronts said first contacting surface, whereby a thread loop may be passed between said first contacting face and said retaining member; and

means for restoring said retaining member from said second position thereof to said first position thereof after such passing of the thread loop.

4,537,143

APPARATUS FOR THE STABILIZING OF THE DIRECTION OF TRAVEL OF WATERCRAFT, SPECIFICALLY A SWORD OR FIN FOR SAILBOARDS

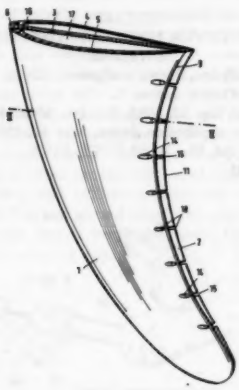
Albert Gaide, Monnaz, Switzerland, assignor to Mistral Windsurfing AG, Nurensdorf, Switzerland

Filed Jul. 2, 1982, Ser. No. 394,687

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1981, 3126371

Int. Cl.³ B63B *3/38*

U.S. Cl. 114—39 **15 Claims**



9. An apparatus for stabilizing the direction of travel of watercraft comprising a guide device extending from a bottom side of the watercraft and having a longitudinal axis, a leading edge, and a trailing edge, said guide device comprising:

two independently from each other flexibly deformable side walls defining a profile of said guide device, said side walls being joined at said leading edge and free from each other at said trailing edge, said side walls having sufficient internal elasticity to hold their trailing edges adjacent said axis while allowing individual and asymmetric deformation of portions of said side walls between said leading edge and said trailing edge in accordance with prevailing pressures against said side walls solely due to velocity of flow and/or solely due to angle of flow thereagainst, and a rigid center wall aligned along said axis, said leading edge of said side walls being joined to a leading edge of said center wall, said trailing edges of said side walls only resting against a trailing edge of said center wall, said portions of said side walls defining together with two oppositely located surfaces of said center wall two substantially closed void spaces or cavities, respectively.

4,537,144

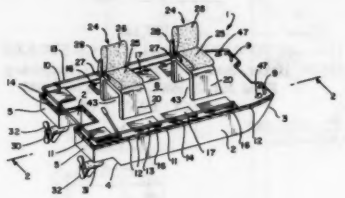
PROPELLED WATER CRAFT

Jerry L. Horton, Bossier City, La., assignor to Small Waters, Inc., Chattanooga, Tenn.

Filed Jan. 17, 1983, Ser. No. 458,310

Int. Cl.³ B63B *1/12*

U.S. Cl. 114—61 **13 Claims**



1. A propelled water craft comprising:

(a) a pair of pontoons in generally parallel, spaced relationship;

(b) a deck connecting and covering said pontoons;

(c) a pair of seat means mounted on said deck;

(d) a first reversible electric motor carried by one of said pontoons, and a second reversible electric motor carried by the other of said pontoons, said first reversible electric motor and said second reversible electric motor mounted in fixed relationship on said pontoons, respectively, and the forward ends of said first reversible electric motor and said second reversible electric motor positioned at a preselected angle with respect to said pontoons, respectively;

(e) first thrust control means for said first reversible electric motor and second thrust control means for said second reversible electric motor mounted on said seat means and cooperating with said first reversible electric motor and said second reversible electric motor, respectively, whereby forward and reverse operation of said first reversible electric motor and said second reversible electric motor are facilitated; and

(f) a portable support means selectively positioned on said deck and a first motor start switch for said first reversible electric motor mounted on said portable support means, and a second motor start switch for said second reversible electric motor mounted on said portable support means and cooperating with said first reversible electric motor and said second reversible electric motor, respectively, whereby said first reversible electric motor and said second reversible electric motor are selectively energized to steer said water craft by operation of one or both of said first reversible electric motor and said second reversible electric motor.

4,537,145

WIND PROPELLED VESSEL

Christopher R. White, 48 Bush St., South Dartmouth, Mass. 02748

Filed Mar. 7, 1984, Ser. No. 587,247

Int. Cl.³ B63B *15/02*

U.S. Cl. 114—91 **11 Claims**

1. A sailing vessel comprising an elongated hull, a mast, a boom pivotally connected at one end to the mast, means to secure the mast and boom to a sail having one side extending along the mast and one part extending near the other end of the boom, and mast supporting and angular adjustment means comprising the following elements operative as follows:

(a) An upper mast holding means connected to the mast;

(b) A lower mast holding means connected to the mast near the bottom end of the mast;

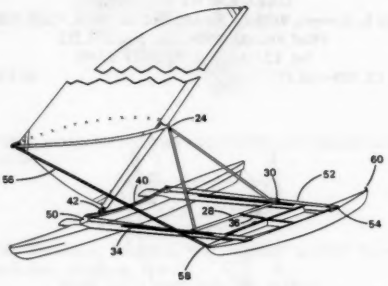
(c) means mounting said lower mast holding means for movement substantially lengthwise of the hull;

(d) means to apply and release restraint on said lengthwise movement while sailing;

(e) means mounting said upper mast holding means for movement substantially sidewise relative to the length of the hull; and

(f) means to apply and release restraint on said sidewise movement while sailing;

(g) whereby during restraint of said sidewise movement, said lengthwise movement is effective to tilt the mast in a direction substantially lengthwise of the hull;



(h) whereby during restraint of said lengthwise movement, said sidewise movement is effective to tilt the mast in a direction substantially sidewise relative to the length of the hull; and

(i) whereby combinations of said sidewise and lengthwise movements are effective to tilt the mast in directions having both lengthwise and sidewise components relative to the length of the hull.

4,537,146

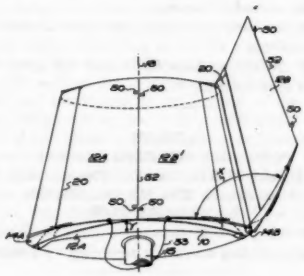
AEROFOILS

Barry Wainwright, Help Cottage, Dundry, Bristol, BS18 8JF, England

Filed Oct. 18, 1982, Ser. No. 434,922

Int. Cl.³ B63H *9/04*

U.S. Cl. 114—103 **3 Claims**



1. An aerofoil, comprising a central panel and lateral panels hingedly connected at each side thereof, the central panel being arranged for rotation about a central longitudinal axis, the lateral panels on the two sides being of similar cross-section and the central panel being of symmetrical cross-section about a median plane passing through said central axis at right-angles to the panel, the cross-sections of the panels being such that either one of the lateral panels can be folded inwardly to lie against the central panel leaving the other lateral panel extended, the combined panels thereby forming a non-symmetrical aerofoil in cross-section, the mirror-image of which can be provided by alternatively folding the other lateral panel, the aerofoil thus formed being adjustable relative to the prevailing air flow by rotation about said axis, the lateral panels also being foldable inwards together to meet edge-to-edge in a stowed configuration for the aerofoil wherein the meeting edges of the lateral panels in the stowed configuration are spaced from the surface of the central panel and the lateral panels provide an external surface whose profile substantially matches that of the external surface of the central panel.

4,537,147

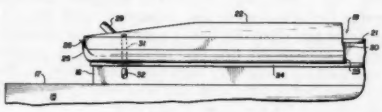
PLASTIC SHEET BARGE HATCH COVER

James E. Nivin, Louisville, Ky., assignor to American Commercial Barge Line Co., Jeffersonville, Ind.

Continuation of Ser. No. 459,204, Jan. 19, 1983, abandoned. This application Aug. 31, 1984, Ser. No. 646,045

Int. Cl.³ B63B *19/12*

U.S. Cl. 114—201 R **4 Claims**



1. A hatch cover that withstands the wind, rain and other in transit and storage conditions encounted by in-water barges which hatch cover can be installed and stored on deck in limited space by two deck hands on open hatch barges having a rimmed coaming extending above the deck about a hatchway to form a substantially rectangular hatch occupying a large portion of the total deck area, comprising in combination,

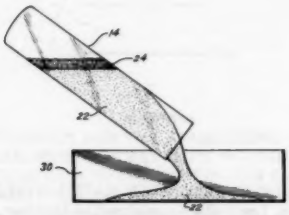
a substantially rectangular thin film plastic sheet for covering the hatch by extending over the rim of the coaming about the hatchway,

four watertight plastic pipe sections formed by hems along substantially the entire edge of said sheet located with the sheet hems for overhanging substantially the entire coaming to hang over the coaming in a position between the coaming rim and the deck and being watertight of such dimensions for filling with water of enough weight and storing it to hold down the edges of the sheet over the coaming edge to seal the hatch and hold the plastic sheet in place with uniform tension while the barge is in transit encountering said in transit conditions, and including for each of the four pipe sections formed by the hems valving structure located for filling and venting the respective pipe sections disposed near opposite ends of the respective pipe sections respectively for rapidly filling one end of the pipe sections with water adjacent the barge by pumps and venting the opposite end and thereafter retaining the water therein for holding the plastic sheet in place covering the hatch, said valving structure on said pipe sections comprising a tapered section extending from each piping section at the rectangle corners, and retaining the water comprising a drawstring for substantially closing the tapered ends of the piping together with means for holding the substantially closed drawstring end of the tapered section at a level above the pipe sections formed by said hem when the pipe sections are filled with water and in place overhanging the coaming.

4,537,148
PACKAGE OF LITTER MATERIAL FOR CATS AND OTHER SMALL ANIMALS

Henry E. Lowe, Jr., 201 N. Edwards St., Cassopolis, Mich. 49031

Continuation-in-part of Ser. No. 439,034, Nov. 4, 1982, , which is a continuation-in-part of Ser. No. 132,285, Mar. 20, 1980, Pat. No. 4,448,151. This application Jun. 28, 1984, Ser. No. 625,529
Int. Cl.³ A01K *1/015*
U.S. Cl. 119—1 15 Claims

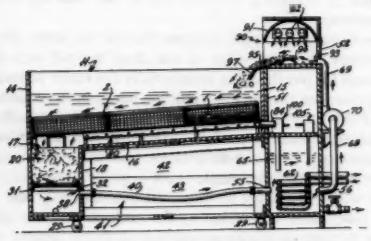


1. A package of litter material for small animals, comprising a container having elongated side walls and opposite end walls, a first layer of relatively light particulate material of organic composition disposed in one end of said elongated container and having an odor suppressant therein, and a second layer of relatively heavy particulate material of inorganic composition disposed in the other end of said elongated container, the end wall adjacent said relatively heavy material being openable for discharging sequentially first said relatively heavy particulate layer and then said relatively light particulate layer to form a multiple layer bed of litter with said relatively light particulate material forming the top layer of said bed.

4,537,149
METHOD AND APPARATUS FOR CLEANING TAINTED SHELLFISH

William J. Ryan, 135 Ramble Rd., Staten Island, N.Y. 10308

Filed Sep. 14, 1982, Ser. No. 418,057
Int. Cl.³ A01K *61/00*
U.S. Cl. 119—4 6 Claims

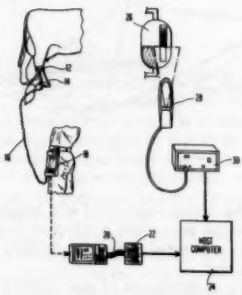


1. In a method for treating bivalves containing inedible impurities to render the bivalves of edible quality by maintaining the tainted bivalves while supported in a holding tank in a quantity of circulating salt water which has been purified with the aid of ultraviolet light irradiation until the impurities have been removed from the bivalves, the improvement which comprises circulating salt water from said holding tank through filter means for removing suspended solid impurities, then through heat exchange means for maintaining the temperature of said circulating water in the range of from about 40° to 70° F., through an ultraviolet light irradiation zone to destroy bacterial impurities present in said water, through an aeration zone to maintain an oxygen content in said circulating salt water in the range of from about 5 to about 10 milligrams dissolved oxygen per liter salt water, and back to said holding tank, while maintaining the average salinity of said salt water in said holding tank in the range of from about 18 to about 31 mg salt per kg water, said salt water being maintained in said holding tank in an amount sufficient to provide at least about 8 gallons of salt water per bushel of said bivalves, and said salt water being circulated at a rate of from about 1 to about 2 gallons per minute.

4,537,150
DATA ENTRY SYSTEMS

David L. Bowers, 9385 La Suvida Dr., La Mesa, Calif. 92041

Filed Feb. 13, 1984, Ser. No. 579,722
Int. Cl.³ A01J *5/00*; G01F *17/00*
U.S. Cl. 119—14.17 10 Claims



8. A system for identifying each cow in a herd and for correlating identification of said cow with milk produced by said cow, the system comprising;

machine-readable identification tag means for providing an encoded symbol indicative of a cow's identity affixed to the cow;

label means attached in predetermined relation to a milk vessel containing milk produced by said cow, for providing machine-readable endoded symbols indicative of relative amounts of milk in said vessel;

scanner means for scanning said identification tag and for scanning said label means;

means for decoding and storing the symbols read by said scanner means; and

means for correlating identification of the cows with the symbols read from the label.

4,537,151
PORTABLE FOLDING CORRAL

William W. Bolton, 8512 N. 32nd Dr., Phoenix, Ariz. 85021

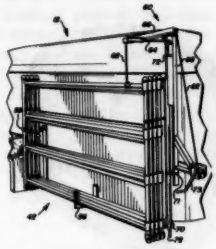
Filed Jul. 30, 1984, Ser. No. 635,934
Int. Cl.³ A01K *15/04*
U.S. Cl. 119—20 13 Claims

1. A portable folding corral for mounting on a trailer, comprising:

folding panel means for forming an enclosure to contain animals such as horses including a plurality of panels rotatably and permanently coupled to each other by sleeve means for allowing said plurality of panels to be folded and for allowing said plurality of panels to be extended in order to form one continuous enclosure, one end of said folding panel means being rotatably coupled to said trailer;

mounting means for mounting said folding panel means on said trailer including means coupled to said trailer and said folding panel means for raising and lowering said folding panel means in order to mount said folding panel means on

the outside of said trailer and to lower said folding panel means to form said enclosure; and



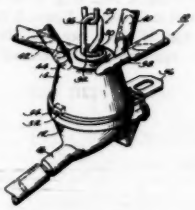
securing means for securing said folding panel means to said trailer.

4,537,152

MILKING CLAW

Paul D. Thompson, Madison, Wis., assignor to DEC International, Inc., Madison, Wis.

Filed Jun. 1, 1984, Ser. No. 616,115
Int. Cl.³ A01J *7/00*
U.S. Cl. 119—14.54 **4 Claims**



1. A milking claw having a bowl and a cover meeting at a generally circular connection,

said cover having a frusto-conical shape with the lower, larger diameter portion connected to said bowl, four inlet nipples connected to the upper side wall of said cover,

each inlet nipple extending upwardly and outwardly from the sloping side wall of the cover generally tangential to said side wall so the incoming milk is downwardly directed and introduced to the interior of the cover in a tangential manner and swirls down and around the sloping inside of said cover on a path having an increasing diameter causing the milk velocity to decrease,

and an outlet from said bowl positioned below said inlet nipples and receiving the milk after its velocity has decreased, any tendency of the milk to flow back to said nipples from said outlet requiring lifting and accelerating the milk.

4,537,153

DEVICE WITH POUCHES FOR RECEIVING ANIMAL WASTE

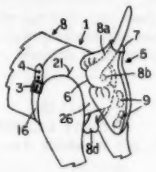
Stella M. Vidal, 21 E. 22nd St., #6H, New York, N.Y. 10010

Continuation-in-part of Ser. No. 337,712, Jan. 7, 1982, abandoned. This application Jun. 21, 1984, Ser. No. 623,222
Int. Cl.³ A01K *23/00*
U.S. Cl. 119—95 **41 Claims**

1. A device to be worn on the body by an animal such as a dog, cat or the like, for receiving and retaining the discharge of body waste, said animal being a wearer of the device, and having a top line, a rear, an anal region at the rear, a tail with a root at the rear above the anal region, a genital region, a belly, hind legs, and forelegs, said root having a top and said tail projecting rearwardly from said root, said device comprising:

a wearer-contacting garment having margins, an upper portion which extends over the top line of the wearer, and a back portion which extends over the rear of the wearer, and said back portion having one opening defined therein of a size to encompass both the root of the tail and the anal region of the wearer, said opening having a continuous periphery extending entirely around an area of the rear of the wearer including the root of the tail and the anal region of the wearer;

container means having at least one entrances opening defined therein to receive the discharge of body waste, said



one entrance opening being of a size to encompass both the root of the tail and the anal region of the wearer and being coextensive with said one opening of said back portion, said entrance opening having a continuous periphery secured to the periphery of said one opening of said back portion entirely around said one opening of said back portion and said entrance opening for connecting said container means to said back portion, said container means being shaped and dimensioned to completely laterally surround said one opening of said back portion and at least a substantial portion of the wearer's tail rearwardly of the root thereof; and

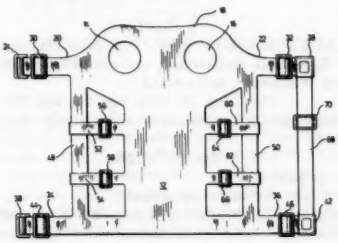
means connected to the margins of the said wearer-contacting garment at selected regions, to fasten the garment tightly yet comfortably and securely around the body of the wearer.

4,537,154

SAFETY VEST OR HARNESS FOR PETS OR SMALL CHILDREN

Fern Kay, 52 Yatesbury Rd., New York, Ontario, Canada M2H 1E9

Continuation-in-part of Ser. No. 390,498, Jun. 21, 1982, abandoned. This application Aug. 8, 1983, Ser. No. 520,928
Claims priority, application Canada, Jun. 20, 1983, 430778
Int. Cl.³ A62B *35/00*
U.S. Cl. 119—96 **7 Claims**



1. An animal or child harness suitable for pets such as dogs, cats or monkeys or for small children, the harness comprising a panel portion of flexible material shaped to pass around the

underneath of the body of the animal or child from one side to the other and to extend over a substantial part of the length of the body in a front to rear direction, a pair of front straps extending laterally from opposite sides of the panel portion adjacent the front thereof for passing laterally across the top of the body of the animal or child behind the neck, said front straps having free end portions carrying releasable securing means to enable said front free end portions to be secured together, a pair of rear straps extending laterally from opposite sides of the panel portion adjacent the rear thereof for passing laterally across the top of the body of the animal or child near the rear thereof, said rear straps having free end portions to be secured together, and a longitudinal strap extending between a front strap and a corresponding rear strap so as to extend centrally along the back of the animal or child in a front to rear direction when the harness is secured in position, a first connecting portion extending between one front strap and a corresponding rear strap, a second connecting portion extending between the other front strap and the other corresponding rear strap, and at least one intermediate strap extending between the main panel portion and each adjacent connecting portion.

4,537,155

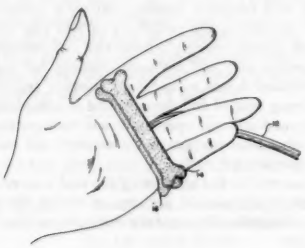
ANIMAL LEASH

Prosper Buratovich, 249 Woodside Ave., Franklin Lakes, N.J. 07417

Filed Oct. 22, 1984, Ser. No. 663,414

Int. Cl.³ A01K *27/00*

U.S. Cl. 119—109 **3 Claims**



1. An animal leash for engaging a ring on an animal's collar comprising a cord having a length approximately twice the normal length of an animal leash; handles permanently affixed to each end of said cord with each of said handles being of a generally rectangular configuration and having a width less than the diameter of a ring on said collar and a length substantially greater than said diameter to enable use of said leash at a first length upon both of said handles being held and at a second length, approximately twice said first length, upon release of one of said handles.

4,537,156

HEAT EXCHANGER HAVING A VERTICAL GAS FLUE

Karl Rees, Ruti, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Aug. 24, 1984, Ser. No. 643,794

Claims priority, application Switzerland, Aug. 31, 1983, 4773/83

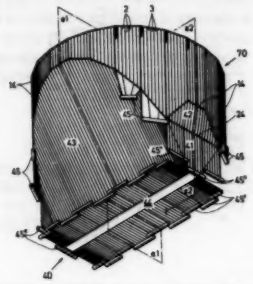
Int. Cl.³ F22B *37/20*

U.S. Cl. 122—6 A **11 Claims**

1. A heat exchanger comprising

a vertical gas flue having a plurality of vertically disposed sides defining at least a pentagonal cross-section, each said side including a plurality of interconnected medium-carrying wall-forming tubes extending longitudinally of said sides;

a hopper below said gas flue having walls defining an outlet opening at a lower end, each said wall including a plurality of parallel interconnected medium-carrying wall-forming tubes; and



each said tube of said hopper being connected to a respective tube of said gas flue along a boundary edge extending over the entire periphery of said gas flue with each tube of said gas flue being bent at said boundary edge.

4,537,157

VERTICAL, COLLECTOR-TYPE HIGH-PRESSURE FEED WATER PREHEATER, WITH A DESUPERHEATER CASING

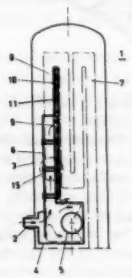
Günter Volks, Lauchringen, Fed. Rep. of Germany, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Jun. 28, 1983, Ser. No. 508,713

Claims priority, application Switzerland, Jun. 30, 1982, 3991/82

Int. Cl.³ F22D *1/00*

U.S. Cl. 122—412 **1 Claim**



1. A vertical, collector-type high-pressure feed water preheater, comprising:

a desuperheater casing;

an outlet feed water collector in the form of a duct which is connected with said casing;

a preheater tube-bundle having serpentine tubes wherein at least a portion of said preheater tube-bundle is enclosed in said duct and is contiguous with said outlet feed water collector;

a plurality of support points being present for fixing the position of said preheater tube-bundle at right angles to its length; and

a plurality of support strips having spacer tabs wherein said serpentine tubes of said preheater bundle are positively fixed in a region of said support points at right angles to a longitudinal axis thereof;

said duct, on two opposite sidewalls in a region of said support points, further comprising widened portions

which, viewed from an interior of said duct, project outward and form support surfaces for said support strips and form stop surfaces for restricting movement thereof in an axial direction of said preheater tube-bundle; and

each of said widened portions including pairs of integral sheet metal flanges located on opposite sidewalls of said duct and a web sheet located between each pair of integral sheet metal flanges, wherein a supporting crosspiece is fastened to an inner surface of said web sheet and said support strips are located above and below said supporting crosspiece whereby support strips of a first layer are staggered relative to support strips of a second layer by a single pipe spacing.

4,537,158

APPARATUS FOR COOLING AN INTERNAL COMBUSTION ENGINE

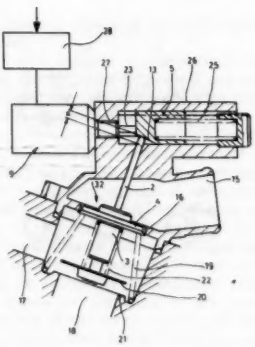
Roland Saur, Stuttgart, Fed. Rep. of Germany, assignor to Behr-Thomson Degnstoffregler GmbH, Fed. Rep. of Germany

Filed Jun. 1, 1984, Ser. No. 616,493

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1983, 3320338

Int. Cl.³ F01P *7/16, 3/20;* **G05D** *7/06*

U.S. Cl. 123—41.1 **6 Claims**



1. Apparatus for cooling an internal combustion engine, comprising:

a thermostatic valve having a closed position for directing a coolant flow to the engine via a direct return, and having an open position for directing the coolant flow to the engine via a radiator when said coolant flow reaches a temperature in excess of an opening temperature of the thermostatic valve;

means for adjusting said opening temperature of the thermostatic valve to at least two different temperature operating levels;

at least one fan associated with said radiator and being operable in at least a lower and a higher output stage in correspondence with at least a lower and a higher engine coolant temperature, respectively; and

switching means, responsive to said means for adjusting the opening temperature of the thermostatic valve, have been for blocking the operation of the lower output stage of said fan when the opening temperature of the thermostatic valve is adjusted to a higher of said at least two different temperature operating levels.

4,537,159

COOLANT RESERVE TANK

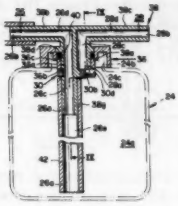
Yoshitomi Matsuzaki, Hatano; Toshihiko Hayashi, Zama, and Keizou Kushibiki, Hachioji, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama and Nihon Radiator Co., Ltd., Tokyo, both of, Japan

Filed Oct. 23, 1984, Ser. No. 664,020

Claims priority, application Japan, Oct. 25, 1983, 58-164008[U]

Int. Cl.³ F01P *11/02;* **B65D** *51/16*

U.S. Cl. 123—41.27 **13 Claims**



1. A coolant reserve tank comprising:

a tank main body having a coolant reserve chamber;

means for defining a coolant conveying passage for conveying coolant to and from a radiator;

means for defining a coolant reserve chamber vent having a first end disposed inside said chamber at a location adjacent the top of same and a second end disposed outside said chamber and opening to the atmosphere; and

a splash-guard member disposed inside said chamber at a location adjacent said first end of said vent and having a sideway passage which extends in a plane normal to the top-to-bottom directions of said tank main body and only through which said first end of said vent opens to said chamber.

4,537,160

AIR CLEANER FOR AN AIR-COOLED ENGINE

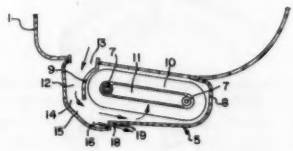
Tetsuaki Shirai, Kobe, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Aug. 8, 1984, Ser. No. 638,736

Claims priority, application Japan, Aug. 12, 1983, 58-125955[U]

Int. Cl.³ F01P *5/06*

U.S. Cl. 123—41.58 **7 Claims**



1. An air cleaner for an air-cooled engine, the engine further including a cooling fan within a fan housing and the fan housing having an air outlet formed therein, said cleaner comprising a casing adapted to be attached to said fan housing, said casing having a side wall, an air inlet opening in said casing which is adapted to communicate with said air outlet of the fan housing and air flowing from said fan, through said air outlet and said air inlet opening and into said casing, an air passage formed within said casing and extending from said inlet opening along said side wall and air from said fan flowing through said passage, an air filter in said air passage, said passage including a curved portion between said air inlet opening and said air

filter, and a slit opening formed in said side wall adjacent said curved portion.

4,537,161

INSERTS FOR PISTONS OF DIESEL ENGINES OF ALUMINUM-SILICON ALLOYS HAVING AN IMPROVED THERMAL RESISTANCE AND MACHINABILITY

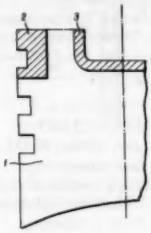
Noel Huret, Noisy-le-Grand, and Jean Meunier, Grenoble, both of France, assignors to Cegedur Societe de Transformation de l'Aluminium Pechiney, Paris, France

Filed Dec. 5, 1983, Ser. No. 558,296

Claims priority, application France, Dec. 8, 1982, 82 20892

Int. Cl.³ C22C *21/04*; C22F *1/04*; F02F *3/04*

U.S. Cl. 123—41.71 **3 Claims**



1. Inserts for pistons of DIESEL engines, said inserts comprised of aluminum-silicon alloys containing 12 to 25% silicon, obtained by powder metallurgy and having both an improved thermal resistance and machinability, as well as a good friction capacity, characterized in that they contain between 2 and 8% by weight of iron and 0.2–1.5% by weight of zirconium.

4,537,162

INTERNAL COMBUSTION ENGINE HAVING A ROTATING PISTON ASSEMBLY

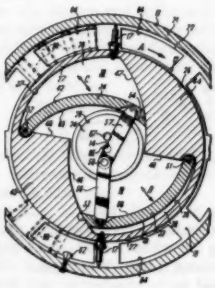
Gerhard K. Kienle, Schonwalterstrasse 11, D-7000, Stuttgart 31, Fed. Rep. of Germany

Filed Dec. 27, 1982, Ser. No. 453,035

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1981, 3150654

Int. Cl.³ F02B *53/00*

U.S. Cl. 123—43 R **35 Claims**



1. An internal combustion engine having a housing including mixture inlet and exhaust gas outlet openings, a rotating piston assembly situated within said housing, and a drive shaft defining an axis of rotation, the rotating piston assembly comprising:

a cylinder which rotates about its longitudinal axis, said cylinder including a transverse end wall having at least one slit formed therein and at least one interior side surface which extends in the direction of said longitudinal axis;

a least one arcuate piston element having a free end defining a sealing surface, said piston element being situated within the cylinder and pivotably mounted at the end opposite to its free end to the cylinder for pivotal movement in the radial direction of the cylinder;

at least one valve slide displaceably supported within a slit of the transverse end wall;

lever means for each piston element for mounting the free end of said piston element to said housing eccentrically of the axis of rotation;

means within the cylinder for engaging the sealing surface of the piston element;

at least one work chamber defined by the piston element, an interior side surface and the transverse end wall; and

means connected to the housing and the valve slide to control the movements of the valve slide to produce compulsory movement of the valve slide in accordance with the rotational movement of the cylinder, such that the slit alternately aligns itself with the inlet and outlet openings.

4,537,163

INTAKE PASSAGES IN CYLINDER HEADS OF AN OPPOSED SIX-CYLINDER ENGINE

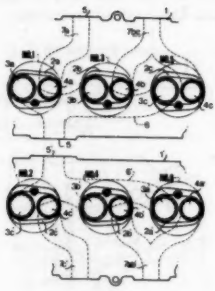
Tatsuo Sakai, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 6, 1983, Ser. No. 558,639

Claims priority, application Japan, Dec. 7, 1982, 57-214144

Int. Cl.³ F02F *1/42*

U.S. Cl. 123—52 MC **3 Claims**



1. In cylinder heads of an opposed six-cylinder engine of the type wherein said cylinder heads are disposed on opposite sides of a crankcase including cylinder blocks, each of the latter having three cylinders, the improvement wherein

said three cylinders of each block being arranged in firing order;

an intake valve provided in each cylinder head adjacent each of said cylinders respectively communicating therewith;

an exhaust valve provided in each cylinder head adjacent each of said cylinders respectively communicating therewith;

said intake valves and said exhaust valves communicating with each said cylinder being disposed in the same arrangement with respect to said each cylinder so that in each of said cylinder heads respectively the distances between adjacent of the intake valves are equal to each other;

each said cylinder head being formed with an intake passage and an opening into said intake passage,

said intake passage in each said cylinder head communicates each of said intake valves in each said cylinder head with said opening in each said cylinder head respectively,

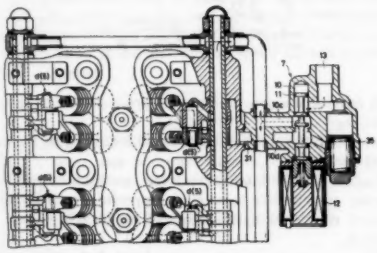
said opening in each said cylinder head respectively being located at a central position between two associated of said intake valves which communicate with two of said three cylinders in the associated cylinder block which are earlier in firing order than the other of said three cylinders in said associated cylinder block.

4,537,164

VALVE ACTUATING APPARATUS

Yoshio Ajiki, Saitama, and Masaaki Matsuura, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 8, 1984, Ser. No. 618,696
Claims priority, application Japan, Jul. 27, 1983, 58-137181
Int. Cl.³ F01L *1/34, 1/26*
U.S. Cl. 123—90.16 **8 Claims**



1. A valve actuating apparatus for an internal combustion engine, comprising:

at least one valve actuator for selectively engaging and disengaging the operation of at least one corresponding valve of said engine in accordance with the pressure of operating oil supplied thereto; and

a spool valve connected through an oil line between said valve actuator and a pressurized source of operating oil for controlling said pressure of said operating oil supplied to said valve actuator, said spool valve having a spool movable between a first position wherein a quantity of operating oil sufficient for energizing said actuator is supplied to said actuator and a second position where the quantity of operating oil supplied to said valve actuator is insufficient for energizing said actuator, said spool valve having a bypass for supplying to said actuator in said second position of said spool in a quantity insufficient for energizing said actuator but sufficient to purge air from a portion of said oil line connecting said spool valve to said actuator.

4,537,165

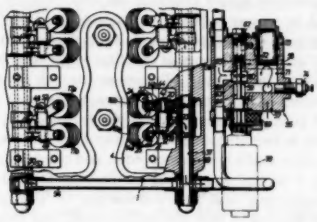
VALVE ACTUATING MECHANISM HAVING STOPPING FUNCTION FOR INTERNAL COMBUSTION ENGINES

Shoichi Honda, Tokyo; Yoshikatsu Nakano, Kawagoe; Makoto Hirano, Asaka, and Masaaki Matsuura, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 19, 1984, Ser. No. 591,145
Claims priority, application Japan, Jun. 6, 1983, 58-100505; Jun. 13, 1983, 58-105458; Jun. 13, 1983, 58-105459
Int. Cl.³ F01L *1/34, 1/26*
U.S. Cl. 123—90.16 **7 Claims**

1. In an internal combustion engine of the type in which at least one pair of intake or exhaust valves having an identical function and disposed adjacent to each other are arranged for use with one cylinder,

a valve actuating mechanism having a stopping function wherein: first and second rocker arms respectively having arms abutting against the upper ends of the paired intake or exhaust valves are rockingly supported on a common support shaft which is fixed on the engine body while having an axis perpendicular to the operating directions of said valves; said first rocker arm is formed with a cylinder bore which is opened toward said second rocker arm to bear a plunger therein whereas said second rocker arm is formed with a guide bore which is opened toward said first rocker arm to fit said plunger therein; a hydraulic



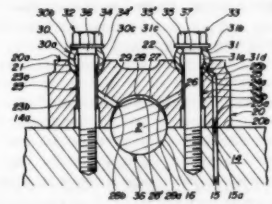
actuation chamber defined between the bottom portion of said cylinder bore and the rear end of said plunger is connected with an oil pressure source through a hydraulic change-over valve for changing the supply and stop of the oil pressure to said actuation chamber; and either of said first or second rocker arm is formed with a cam slipper for sliding contact with a cam which is adapted to rotate in accordance with the run of said engine.

4,537,166

LUBRICATING ARRANGEMENT IN VALVE MECHANISM OF AN OVERHEAD CAMSHAFT ENGINE

Kenji Kimura, Sayama, and Masayasu Nishikawa, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 27, 1983, Ser. No. 536,253
Claims priority, application Japan, Sep. 27, 1982, 57-168210
Int. Cl.³ F01L *1/46*
U.S. Cl. 123—90.36 **11 Claims**



6. In a valve mechanism for an internal combustion engine of the overhead camshaft type, including a cylinder head having a lubricating oil passage formed therein, at least one pair of intake valve and exhaust valve, a pair of rocker shafts, each having a substantially cylindrical outer configuration and a hollow interior defined therein, each of said rocker shafts having a peripheral wall thereof formed with a pair of diametrically opposite through holes, at least one pair of rocker arms supported on said rocker shafts for rocking motions thereabout and drivingly coupled, respectively, to said intake valve and said exhaust valve, a camshaft drivingly coupled to said rockerarms for causing rocking motions thereof, whereby rocking motions of said rocker arms in response to rotation of said camshaft cause said intake valve and exhaust valve to be closed and opened alternately, a camshaft holder rotatably supporting said camshaft and supporting said rocker shafts, said camshaft holder having first and second bolt-fitting holes formed therein, and first and second bolts extending through respec-

tive ones of said through holes of said rocker shafts and said first and second bolt-fitting holes of said camshaft holder and threadedly fitted in said cylinder head to fasten said rocker shafts and said camshaft holder thereto, the improvement wherein said camshaft holder has first and second bearing recesses, each having a generally semicylindrical shape corresponding to said outer configuration of said rocker shafts, said first and second bearing recesses opening in a side surface of said camshaft holder remote from said cylinder head and arranged in spaced relation to each other, said rocker shafts having part of said peripheral walls thereof supportedly received in respective ones of said first and second bearing recesses, a first lubricating oil passage formed in said camshaft holder and having one end communicating with said lubricating oil passage formed in said cylinder head and another end opening in one of said first and second bearing recesses, one of said rocker shafts being received in said one bearing recess and having a second lubricating oil passage formed therein and communicating said first lubricating oil passage with said hollow interior of said one rocker shaft, said first and second bolt-fitting holes extending from respective ones of said first and second bearing recesses to another side surface of said camshaft holder facing said cylinder head, one of said through holes of each said rocker shafts communicating said hollow interior of said each rocker shaft with a corresponding one of said first and second bolt-fitting holes, a corresponding one of said first and second bolts extending through said one through hole, said first and second bolt-fitting holes and said one through holes of said rocker shafts each having an inner diameter larger than the outer diameter of said corresponding one bolt to define first and second annular gaps, respectively, between said first and second bolts and corresponding ones of said bolt-fitting holes and corresponding ones of said one through holes, said camshaft holder further having a recess formed in said another side surface thereof and having an inner peripheral surface, said recess cooperating with a recess formed in a surface of said cylinder head facing said camshaft holder to define a generally cylindrical bearing space in which said camshaft is supportedly fitted, a circumferentially extending peripheral groove formed in said inner peripheral surface of said recess of said camshaft holder, and first and second communication passages formed in said camshaft holder and communicating said peripheral groove with respective ones of said first and second annular gaps.

4,537,167

ENGINE CYLINDER LINERS BASED ON ALUMINUM ALLOYS AND INTERMETALLIC COMPOUNDS, AND METHODS OF OBTAINING THEM

Michel Eudier, Paris; Noël Huret, Noisy le Grand, and Jean Meunier, Crenoble, all of France, assignors to Cegedur Societe de Transformation de L'Aluminim Pechiney and Alliages Frittes METAFRAM, both of Paris, France

Filed Dec. 5, 1983, Ser. No. 557,947
Claims priority, application France, Dec. 9, 1982, 82 20983
Int. Cl.³ F02F *1/18*
U.S. Cl. 123—193 C **14 Claims**

1. Engine cylinder liners comprising:

(1) a matrix comprising an aluminum alloy produced by powder metallurgy, said alloy being selected from the group consisting of A—S_{12}UG alloys and series 7,000 alloys containing from 1 to 12% by weight added silicon, and

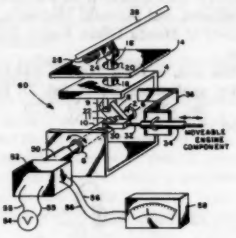
(2) a dispersion of grains distributed within said matrix comprising at least one added intermetallic compound having a melting point of more than 700° C., said grains being distinct and not forming part of the actual alloy structure.

4,537,168

ENGINE COMPONENT POSITION INDICATING SYSTEM

Bretislav Durisin, Wooster, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed Jun. 4, 1984, Ser. No. 616,634
Int. Cl.³ G01M *13/00*
U.S. Cl. 123—198 R **11 Claims**



1. A moveable engine component position indicating system comprising;

a frame secured against movement with respect to the engine component,

an elongate shaft rotatably mounted on the frame in such a manner as to be able to rotate in opposite directions about a central rotational axis extending between opposite ends thereof,

input means operatively secured to the shaft and functional to rotate the shaft in opposite directions about the central rotational axis thereof in response to movement of the input means in opposite directions,

output means operatively secured to the shaft and functional to move in opposite directions in response to the rotation of the shaft in opposite directions,

linking means operatively connected at one end to the output means and at an opposite end to the engine component and functional to move the component in opposite directions in response to movement of the output means in opposite directions,

operator controlled means operative to enable an operator to move the input means in opposite directions and cause the input means to rotate the shaft in opposite directions and cause the shaft to move the output means in opposite directions and cause the output means to cause the linking means to move the engine component in opposite directions to a desired position,

indicator means, operative to visually indicate the position of the engine component in response to receipt of a position signal indicative of the rotational position of the shaft with respect to a predetermined initial rotational position, and

signal generating means operatively coupled to at least one end of the shaft and functional to provide the position signal to the indicator means in response to the rotation of the shaft.

4,537,169

FUEL INJECTION DEVICE OF DIESEL ENGINE

Noboru Tsuge, Kariya; Masahiro Taguchi, Okazaki; Masanori Kato, Toyoake, and Satosi Kuwakado, Aichi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed May 31, 1983, Ser. No. 499,401
Claims priority, application Japan, May 31, 1982, 57-91363
Int. Cl.³ F02M *51/00*
U.S. Cl. 123—325 **3 Claims**

1. A fuel injection device of a diesel engine comprising;

a fuel injection nozzle;

a fuel injection pump;

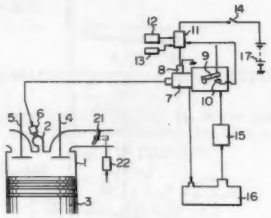
a control means for the fuel injection pump; and

an intake air throttling valve interlocked with an accelerator

so as to throttle the intake air during accelerator nonoperation;

characterized in that there are provided:

a means for detecting engine braking and



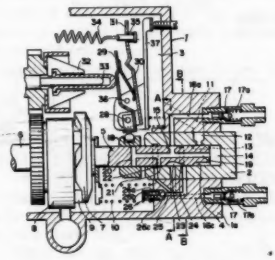
a means for controlling fuel injection by signals from said detecting means, so that fuel injection is interrupted during engine braking where the accelerator does not operate and vehicle speed and engine speed exceed a predetermined speed.

4,537,170

DISTRIBUTION TYPE FUEL INJECTION PUMP

Keiichi Yamada, and Hideyuki Kimura, both of Higashi-Matsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Feb. 28, 1984, Ser. No. 585,218
Int. Cl.³ F02M *41/00*
U.S. Cl. 123—449 **6 Claims**



1. In a distribution type fuel injection pump having a suction chamber for containing fuel, a plunger bore having a pump chamber in the inner end thereof and communicating with said suction chamber, a reciprocating and rotating plunger reciprocally and rotatably sliding in said plunger bore for drawing fuel from said suction chamber into said pump chamber and pressurizing it therein, a plurality of fuel distribution passages extending from said bore to supply pressurized fuel through injection pipes to corresponding fuel injection nozzles, said distribution passages opening into said bore at points spaced around the periphery thereof, said plunger having a distributing port communicating with said pump chamber and opening out of the peripheral surface of said plunger in alignment with the distribution passages when said plunger is in a position in which fuel is pressurized in said pump chamber, the improvement comprising:

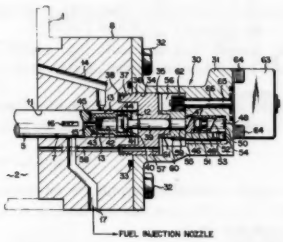
a delivery valve in each of said fuel distribution passages which creates substantial suction downstream thereof when it closes for reducing the pressure in the fuel injection pipes at least to near zero, said plunger having an auxiliary port opening out of the periphery thereof spaced along the plunger from said distribution port and connected with said pump chamber, said bore having a groove therearound in a position to be aligned with said auxiliary port during the time of the stroke of said plunger when said distribution port is aligned with one of said distribution passages, a communicating passage in said pump opening into said plunger bore adjacent said distribution paths, said plunger having a uniform pressure slit therealong spaced circumferentially from said distribution port by an amount of at least the spacing of said distribution paths around the circumference of said bore and having the end thereof aligned with said communicating passage for receiving pressurized fuel from said communicating passage and delivering it to a distribution passage other than the distribution passage to which pressurized fuel is being delivered from said distribution port, and a pressure equalizing valve in said communicating passage for limiting the pressure of the fuel in said communicating passage to a pressure slightly less than the pressure required to open the fuel injection nozzles.

4,537,171

FUEL INJECTION DEVICE

Masatoshi Kuroyanagi, Kariya, and Masahiko Suzuki, Aichi, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Feb. 24, 1984, Ser. No. 583,265
Claims priority, application Japan, Feb. 28, 1983, 58-33186
Int. Cl.³ F02M *41/00*
U.S. Cl. 123—449 **10 Claims**



1. A fuel injection device for injecting fuel into a combustion chamber of an internal combustion engine, comprising:

a pump housing;

a pump cylinder portion provided in said pump housing;

a pump plunger fitted in said pump cylinder portion in such a manner as to slide in its axial direction, said pump plunger defining a fuel pumping chamber for receiving the fuel in said pump cylinder portion;

fuel delivery means for reciprocating said pump plunger in said pump cylinder portion, thereby delivering the fuel in the fuel pumping chamber to the combustion chamber; and

a controller for controlling a fuel delivery rate from the fuel pumping chamber to the combustion chamber, the fuel delivery rate indicating the amount of fuel delivered from the fuel pumping chamber per stroke travel-unit of said pump plunger, said controller including,

a body having therein a controller cylinder portion which is provided coaxially with said pump plunger,

piston means having a piston fitted in the controller cylinder portion of the body in a liquid-tight manner so as to be slidable in the axial direction of said pump plunger, one end of the piston extending into the fuel pumping chamber and engaging the distal end of said pump plunger so that the piston is moved together with said pump plunger in the same moving direction thereof when said pump plunger is moved in such a first direction as to increase the volume of the fuel pumping chamber, and that the piston receives the pressure of the fuel in the fuel pumping chamber to axially move independently of said pump plunger when said pump plunger is moved in such a second direc-

tion as to decrease the volume of the fuel pumping chamber, and

control means for controlling the movement of the piston in such a manner that, when said plunger is moved in the second direction, the piston is prevented from being moved in the second direction or the moving speed of the piston is decreased, the movement of the piston being controlled in accordance with the operating condition of the engine.

4,537,172

FUEL SUPPLY CONTROL APPARATUS FOR AN INTERNAL-COMBUSTION ENGINE

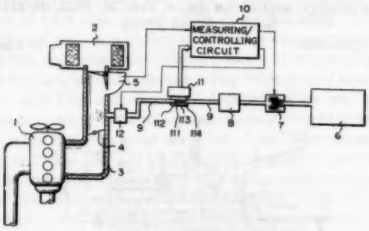
Kenji Kanehara, Aichi; Tokio Kohama, Nishio; Hisasi Kawai, Toyohashi, and Norihito Tokura, Aichi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Oct. 21, 1983, Ser. No. 544,416

Claims priority, application Japan, Nov. 26, 1982, 57-207921

Int. Cl.³ F02M *21/04*

U.S. Cl. 123—527 **6 Claims**



1. A fuel supply control apparatus for an internal-combustion engine having a fuel gas passage leading to an intake air passage, comprising:

a means for vaporizing liquid fuel and supplying vaporized fuel to said fuel gas passage;

a means for detecting the actual mass flow rate of said vaporized fuel flowing through said fuel gas passage said actual mass flow rate detecting means being provided in said fuel gas passage downstream of said liquid fuel vaporizing means;

a means for detecting the load of said engine;

a means for calculating the mass flow rate of fuel in accordance with the detected load of said engine; and

a means for controlling feedback of fuel to be supplied to said engine so that the detected actual mass flow rate of said vaporized fuel is close to the calculated mass flow rate of fuel.

4,537,173

FREE-RUNNING ROTARY INDUCTION SYSTEM

Claude R. Norris, 9030 Normandy La., Dayton, Ohio 45459

Filed Sep. 26, 1984, Ser. No. 655,188

Int. Cl.³ F02M *29/02*

U.S. Cl. 123—592 **6 Claims**

1. An improved fuel distribution system for a multi-cylinder internal combustion engine which includes

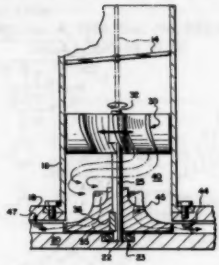
an intake manifold having

an inlet stack with a mount for a carburetor and

a plurality of runner passages below said stack extending to intake ports at each cylinder,

a shaft having an axial flow turbine thereon and a radial flow impeller thereon spaced from said turbine,

said manifold including bearing means providing a freely rotatable mounting for said shaft supporting said turbine in said stack and said impeller therebelow, and



a diffuser in said manifold surrounding said impeller and connected to each of said runner passages.

4,537,174

OUTPUT SUPPLY CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINE MAGNETO GENERATOR

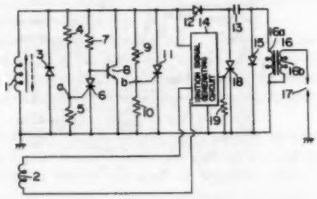
Masao Nagasawa, Kariya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 31, 1983, Ser. No. 480,924

Claims priority, application Japan, Apr. 2, 1982, 57-55699; Apr. 22, 1982, 57-67549; May 7, 1982, 57-77059; May 17, 1982, 57-82890; Sep. 13, 1982, 57-160246; Oct. 25, 1982, 57-187160

Int. Cl.³ F02P *1/00*

U.S. Cl. 123—604 **14 Claims**



1. An apparatus for controlling the supply of an output from a magneto generator of an ignition system comprising:

a generating coil of said magneto generator;

a shorting semiconductor switching element for substantially short-circuiting an output from said generating coil;

an interruption control circuit for turning off said shorting semiconductor switching element when a short-circuit current flowing therethrough reaches a predetermined value;

a capacitor disposed to be charged by a high voltage induced in said generating coil when said shorting semiconductor switching element is turned off;

an ignition coil having a primary winding and a secondary winding;

an ignition signal generating circuit voltage regulator circuit connected in series with said shorting semiconductor switching element to receive an output supplied from said generating coil in response to the turning on of said shorting semiconductor switching element and generate a constant voltage output;

an ignition signal generating circuit for receiving said constant voltage output from said voltage regulator circuit as a power supply and generating an ignition signal;

an ignition semiconductor switching element responsive to

said ignition signal from said ignition signal generating circuit to turn on and thereby supply a stored charge on said capacitor to the primary winding of said ignition coil; and

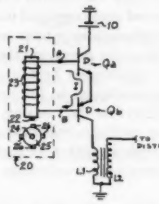
a spark plug connected to the secondary winding of said ignition coil.

4,537,175

BIPOLAR MAGNETIC PULSE ACTIVATED IGNITION SYSTEM

Martin E. Gerry, 13452 Winthrope St., Santa Ana, Calif. 92705

Filed Nov. 29, 1984, Ser. No. 676,514
Int. Cl.³ F02P 1/00
U.S. Cl. 123—649 **21 Claims**



1. An ignition system for a fuel burning engine, said system having a transformer with a primary winding, characterized by the combination of:

a pair of transistors of opposite conductivities, each of said transistors having an input and an output circuit, the output circuits of said transistors being connected in series, said primary winding being serially coupled to the output circuits of said transistors; and

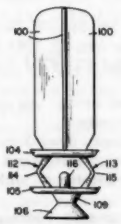
a timer coupled to the input circuits of said transistors.

4,537,176

BLOW DART GAME INCLUDING HOLLOW TUBE AND DART WITH TARGET IMPACTING MEMBER AND SHOCK-ABSORBING PORTION

David M. Stravitz, New York, N.Y., and Gary D. Johnson, 151 Hudson St., New York, N.Y. 10013, assignors to Gary D. Johnson, New York, N.Y.

Filed Jan. 18, 1983, Ser. No. 458,962
Int. Cl.³ F41B 1/02
U.S. Cl. 124—62 **20 Claims**



1. A blow dart game comprising:

an elongated hollow tubular member which is open at both ends;

abutment means spaced inwardly from an end of said elongated tubular member and comprising an abutment internally of said elongated tubular member;

a dart having a front target impacting suction cup member, an air guiding section extending rearwardly of said target impacting member, and a resiliently yieldable shock-absorbing portion extending rearwardly of said target impacting member, said shock absorbing portion comprising at least two resilient, spaced apart members coupling said front target impacting member with said air guiding section of said dart; and

sealing means on said dart for providing a substantial seal interior of said elongated tubular member when said dart is placed interior of said elongated tubular member, said sealing means being rearward of said target impacting suction cup member, said suction cup member being smaller in diameter than said sealing means so that said suction cup member passes substantially freely through said tubular member;

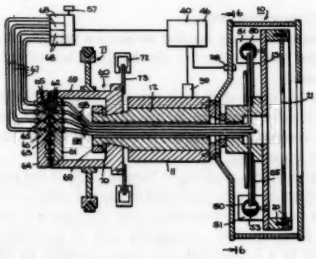
said abutment means being abuttable against at least a portion of said dart when said dart is interior of said elongated tubular member to prevent said dart from inadvertently coming out of the end of said elongated tubular member at which said abutment means is located.

4,537,177

BALANCED ROTARY SAW ASSEMBLY AND A METHOD OF BALANCING THE SAME

Robert E. Steere, Jr., Boonton, and Thomas Lewandowski, Wanaque, both of N.J., assignors to Silicon Technology, Oakland, N.J.

Continuation-in-part of Ser. No. 376,173, May 7, 1982, abandoned. This application May 2, 1983, Ser. No. 490,664
Int. Cl.³ B28D 1/04
U.S. Cl. 125—13 R **12 Claims**



1. In combination

a rotary saw assembly including a wheel head rotatably mounted about an axis of rotation and an internal diamter blade mounted on said wheel head about said axis of rotation; and

balancing means for transferring a mass of a fluid medium about said wheel head during rotation of said wheel head from a heavier unbalanced side to a lighter side to automatically maintain said wheel head in balance, said balancing means including a plurality of circumferentially spaced chambers mounted on said wheel head for rotation therewith and sized to receive a fluid balancing medium therein, at least one connecting tube communicating one of said chambers with at least one other of said chambers to pass fluid medium therebetween, and means for connecting a compressed air source to said one chamber in response to an unbalance of said wheel head to deliver compressed air into said one chamber to force balancing medium therefrom through said connecting tube into said other chamber to balance said wheel head.

4,537,178

HIGH EFFICIENCY FURNACE

Kyu S. Hwang, St. Claire Beach, and Dennis J. Koestler, Leamington, both of Canada, assignors to Duo-Matic/Olsen Inc., Ontario, Canada

Filed Dec. 16, 1983, Ser. No. 562,437
Int. Cl.³ F24H *3/02*
U.S. Cl. 126—110 R **7 Claims**

1. A furnace comprising:

an exterior housing having means for introducing air to be heated and means for discharging heated air from the furnace;

at least one clam-shell type primary heat exchanger having a combustion chamber for the ignition of fluid fuel yielding hot combustion gases in a lower end and an exhaust outlet in an upper end;

a secondary heat exchanger having an inlet for receiving the combustion gases produced in the primary heat exchanger in an upper end communicating with the exhaust outlet of the primary heat exchanger and a secondary exhaust outlet in a lower end, and being parallel to the primary heat exchanger, said primary and secondary heat exchangers being vertically oriented relative to the furnace housing;

a tertiary heat exchanger for receiving combustion gases and condensate from the secondary exhaust outlet, comprising a pair of spaced apart opposed manifolds, a plurality of parallel condensation tubes interconnecting the manifolds, and drainage means for removing the condensate from the manifolds, the tertiary heat exchanger oriented approximately perpendicular to the primary and secondary heat exhangers, horizontally relative to the housing, below the combustion chamber of the primary heat exchanger, and below the secondary exhaust outlet;

exhaust means communicating with the tertiary heat exchanger for removing combustion gases from the housing; and

an induced draft blower for (a) drawing combustion gases through the primary, secondary and tertiary heat exchangers, (b) inducting sufficient air to the combustion chamber of the primary heat exchanger for efficient combustion, and (c) forcing the combustion gases through the exhaust means.

7. A furnace comprising:

an exterior housing having means for introducing air to be heated and means for discharging heated air from the furnace;

at least one clam-shell type primary heat exchanger having a combustion chamber for the ignition of fluid fuel yielding hot combustion gases in a lower end and an exhaust outlet in an upper end;

a conduit having an inlet for receiving the combustion gases produced in the primary heat exchanger in an upper end communicating with the exhaust outlet of the primary heat exchanger and an exhaust outlet in a lower end, said conduit being parallel to the primary heat exchanger;

a condensing heat exchanger for receiving combustion gases and condensate from the conduit exhaust outlet, comprising a pair of spaced apart opposed manifolds, a plurality of parallel condensation tubes interconnecting the manifolds, and drainage means for removing the condensate from the manifolds, the condensing heat exchanger oriented approximately perpendicular to the primary heat exhanger, horizontally relative to the housing, and below the combustion chamber of the primary heat exchanger;

exhaust means communicating with the condensing heat exchanger for removing combustion gases from the housing; and

an induced draft blower for (a) drawing combustion gases through the primary heat exchanger, the conduit and condensing heat exchanger, (b) inducting sufficient air to the combustion chamber of the primary heat exchanger for efficient combustion, and (c) forcing the combustion gases through the exhaust means.

4,537,179

POLYMER-GEL COVERED SOLAR ENERGY COLLECTOR AND STORAGE UNIT

Ebtisam S. Wilkins, and Michael G. Wilkins, both of 643 Fairview Rd. NW., Albuquerque, N. Mex. 87107

Continuation of Ser. No. 273,594, Jun. 15, 1981, abandoned.
This application Nov. 4, 1983, Ser. No. 549,015
Int. Cl.³ B01J *11/18*; C09K *3/00*; F24J *3/02*
U.S. Cl. 126—415 **5 Claims**

1. A solar pond comprising:

(a) a container deployed to receive solar radiation;

(b) a transparent heat-absorbing fluid within the container freely flowing therein and heated principally by convection currents induced by solar radiation;

(c) means for withdrawing heat from the fluid; and

(d) a transparent, cross-linked, aqueous polymer gel covering the fluid in amount and thickness sufficient to decrease substantially heat losses therefrom.

4,537,180

SOLAR HEATING AND STORAGE UNIT

John W. Minor, 173 Dolphin Ave. SE., St. Petersburg, Fla. 33705

Continuation of Ser. No. 313,270, Oct. 21, 1981, abandoned.
This application Aug. 21, 1984, Ser. No. 642,751
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—437 **12 Claims**

1. A solar heater and storage unit comprising:

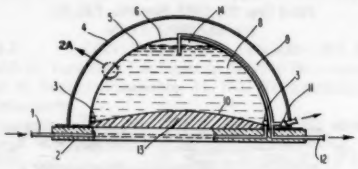
an insulated base structure,

a hemispherically shaped inner dome having a surface capable of absorbing solar energy and attached to said base to form a reservoir capable of withstanding a preselected pressure,

a substantially transparent hemispherically shaped outer dome having a diameter larger than said inner dome and positioned over said inner dome,

means for introducing a fluid under pressure into the bottom area of said reservoir,

a diffuser, said fluid being introduced into said reservoir through said diffuser without disturbing the fluid at the top of said reservoir, and



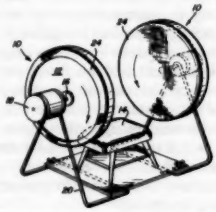
exit means for removing heated fluid under said pressure from the top of said reservoir.

4,537,181

HYDROMAGNETIC APPARATUS FOR NON-SURGICAL IN VIVO REMOVAL OF CALCIUM DEPOSITS

William N. Shalhoob, Santa Ynez, and Alfred F. Kaspaul, Malibu, both of Calif., assignors to Hydromagnetics, Inc., Solvang, Calif.

Filed Dec. 5, 1978, Ser. No. 966,630
Int. Cl.³ A61N *1/42*
U.S. Cl. 128—1.3 **4 Claims**



1. Apparatus for treatment of arthritic conditions of the body, comprising:

magnetic means for producing a magnetic field of an effetive field intensity, the magnetic means comprising a support plate and a plurality of annular magnetic segments disposed on one face of the support plate, the polarity of outer portions of each segment being opposite to the polarity of outer portions of adjacent segments; and

means for rotating the magnetic means at a desired rotational speed.

4,537,182

ENDOSCOPE

Yutaka Otani, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jan. 25, 1983, Ser. No. 460,779
Claims priority, application Japan, Feb. 2, 1982, 57-15074
Int. Cl.³ A61B *1/00*
U.S. Cl. 128—4 **2 Claims**

1. An endoscope comprising:

(i) an elongated insertion section having a distal end and a proximal end, said insertion section being adapted to be inserted in a coelic cavity;

(ii) a control section connected to the proximal end of said insertion section;

(iii) a suction channel member having first and second ends disposed in said insertion section, the first end of said suction channel member being open to the distal end of said insertion section, and the second end of said suction channel member being connected to said control section;

(iv) a suction tube having first and second ends, the first end of said suction tube being positioned in said control section;and

(v) a suction selector mechanism disposed in said control section, which allows connection of the second end of said suction channel member with the first end of said suction tube, and which selectively connects said suction channel member and said suction tube, said suction selector mechanism including :

(a) a cylinder having an inner surface portion a cross-section of which has a circular shape,

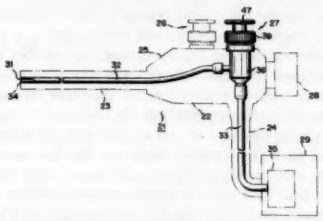
(b) a piston having an outer surface disposed inside said cylinder and, as part of the outer surface, a circular outer surface portion being provided such that it is brought into air-tight and slidable contact with the inner surface portion of said cylinder, said piston being capable of adopting a non-pressed position and a pressed position and of moving therebetween,

(c) regulating means for regulating movement of said piston between the non-pressed position and the pressed position,

(d) urging means for urging said piston into the non-pressed position,

(e) an end portion which is formed as a unit with said piston and extends therefrom toward said regulating means,

(f) a first connecting port which is formed in the inner surface portion of said cylinder and which connects with the second end of said suction channel member, said first connecting port being closed by the circular outer surface



portion of said piston when said piston is positioned in the non-pressed position, and being freed of the circular outer surface portion of said piston when said piston is positioned in the pressed portion,

(g) a small-diameter portion which is formed along the outer surface of said piston and which defines a space with the inner surface portion of said cylinder, said small-diameter portion being positioned opposing said first connecting port when said piston is in the pressed position,

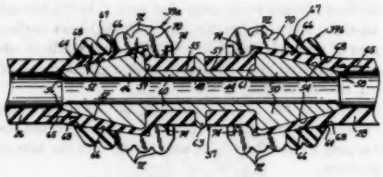
(h) a second connecting port disposed in said cylinder and connected to the first end of said suction tube, said second connecting port being positioned outside a range of movement of the circular outer surface portion of said piston,

(i) communicating means, formed in said piston, for communicating the space defined by said small-diameter portion with said second connecting port, said end portion of said piston having a leakage hole of a certain diameter communcating with the outside of said control section, said piston having said communicating means and a hollow chamber which communicates with said leakage hole, said hollow chamber having a diameter greater than the diameter of said leakage hole, the outer surface of said small-diameter portion being tapered from said leakage hole towards said hollow chamber and having a hole continuously open to said hollow chamber.

4,537,183
CONNECTOR DEVICE FOR CONNECTING ELASTIC TUBING OF AN IMPLANTABLE DEVICE

Terence M. Fogarty, Lakeland, Minn., assignor to Mentor Corporation, Minneapolis, Minn.

Filed Apr. 8, 1983, Ser. No. 483,186
Int. Cl.³ A61F 5/00
U.S. Cl. 128—79 9 Claims



1. An implantable device for implantation in a living body, the device comprising:

first implantable component means for implanting into a first portion of the body and having a fluid reservoir;

second implantable component means for implanting into a second portion of the body spaced from the first portion of the body, the second component means having a fluid chamber;

a first section of elastic tubing fixedly attached at one end to the first implantable component means;

a second section of elastic tubing fixedly attached to the second implantable component means; and

a connector device for fluidly connecting the first and second sections of elastic tubing, each tubing section having an outer surface with an outer diameter and an inner surface with an inner diameter, the connector comprising:

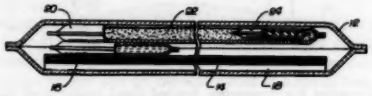
a main body having first and second ends and a connector fluid passage extending between the first and second ends, a center surface section having an outer diameter, and first and second frusto-conical surface sections disposed proximate the first and second ends with the maximum diameter of the first and second frusto-conical surface sections being greater than the outer diameter of the center surface sections, the first and second frusto-conical surface sections frictionally engaging the inner surface of the first and second sections of tubing, respectively; and

first and second clamps, each clamp having a body with an inner substantially smooth frusto-conical surface defining a cavity, the cavity having a forward and a rearward end with a opening at least equal to the outer diameter of the tubing, said opening being defined by a cylindrical surface portion of a constant diameter contiguous with the inner frusto-conical surface, the tubing extending through the opening and the cavity, and the inner frusto-conical surface engaging the outer surface of the tubing which is located over the frusto-conical surface of the connector device so that a compressive force is exerted on the tubing between the inner frusto-conical surface of the clamp and the outer frusto-conical surface of the connector, in a direction opposing any creeping of the tubing section and retaining tubing on the frusto-conical surface section and wherein the first clamp has a plurality of flexible fingers proximate the forward end and wherein at least one of the fingers has an inwardly projecting spur for retaining the clamp in position over the tubing and the first frusto-conical surface, said spur being positioned at a forward end of the finger such that the spur is disposed between the first frusto-conical surface and the center surface section of the main body.

4,537,184
PORTABLE ORTHOPAEDIC SPLINT SYSTEM

James T. Williams, Jr., 4316 Marina City Dr., Apartment No. 633, Marina Del Rey, Calif. 90291

Filed Sep. 27, 1983, Ser. No. 536,342
Int. Cl.³ A61F 13/04
U.S. Cl. 128—90 5 Claims



1. A portable orthopaedic splint system, comprising:

a durable tear-resistant outer bag containing a linear segment of an orthopaedic splint material impregnated with an unreacted hardening agent;

an inner bag containing a liquid for reacting with said hardening agent to produce a hard, stiff splint, said inner bag capable of being ruptured by manual pressure upon said outer bag and being in juxtaposition with said splint material, whereby when said outer bag is manually squeezed to rupture said inner bag, the liquid from said inner bag will be released, mix with said splint material, and react with the hardening agent therein to form a hard, stiff splint; and

a refrigeration bag in juxtaposition with said linear splint material, said refrigeration bag comprising a durable tear-resistant outer refrigeration bag containing a water reactive refrigeration agent and an inner refrigeration bag containing water, said inner refrigeration bag capable of being ruptured by manual pressure to release said water for reaction with said refrigeration agent to produce a cooling effect in said splint system and thereby counteract any heat released from the reaction of said hardening agent and reduce any swelling in the injured area to which the splint system is applied.

4,537,185
CANNULATED FIXATION SCREW

Denis P. Stednitz, 209 Via Pasqual, Redondo Beach, Calif. 90017, assignor to Denis P. Stednitz, Redondo Beach, Calif.

Filed Jun. 10, 1983, Ser. No. 502,924
Int. Cl.³ A61F 5/04
U.S. Cl. 128—92 B 1 Claim

1. A cannulated fixation screw for use in orthopedic surgery comprising;

an elongate hollow shaft defining a cannula through the center of the shaft;

self-tapping threads adjacent the distal end of the shaft formed by a plurality of flutes arcuately spaced apart around the circumference of the shaft having lands therebetween, each of said lands having a plurality of threads thereon and a heel, the flutes forming a plurality of self-tapping cutting edges on each of said threads, each thread having a maximum thread height at the cutting edge thereof, and a mimimum thread height at the heel of the land in which the thread is located; and

means on the distal tip forming a plurality of teeth projecting

from said distal tip, each of said teeth forming a drilling edge formed by the intersection of the cutting face of the corresponding land, the cannula and the exterior of the corresponding land.

4,537,186

CONTRACEPTIVE DEVICE

Karel J. H. Verschoof, Staringstraat 31, 7514 DE Enschede, and Jan W. Smit, Schumannlaan 31, 7522 KD Enschede, both of Netherlands

Continuation of Ser. No. 378,821, May 17, 1982, abandoned, which is a continuation of Ser. No. 92,266, Nov. 8, 1979, abandoned. This application Sep. 2, 1983, Ser. No. 528,865

Int. Cl.³ A61F *5/46*

U.S. Cl. 128—130 **3 Claims**

1. A contraceptive device comprising a body adapted to block an oviduct passage through a user's uterine muscle tissue, said body having a first means for effecting closure of the oviduct passage by forcibly seating against the uterine muscle tissue at and around the mouth defined at the opening of the oviduct passage into the uterine cavity, an elongate connection means connected with said first means for extending therefrom through said mouth of the oviduct passage, and a second means connected with said elongate connection means for effecting closure of the oviduct passage opening where the user's Fallopian tube connects with the oviduct passage by forcibly seating against the uterine muscle tissue at and around such oviduct passage opening, said first and second means being of bulbous form abruptly enlarged with respect to said connection means to present opposed surface portions, said elongate connection means being of a length in the range of about 2–14 mm determined from anatomic data of the user which assures that said opposed surface portions are forcibly seated against the uterine muscle tissue to effect their closures of the oviduct passage predominantly at the largest diameters of the bulbous portions respectively at said mouth of the oviduct passage and at said opening of the oviduct passage where the Fallopian tube connects with the oviduct passage, said connection means being of generally cylindrical form and of sufficient diameter as determined from anatomical data of the user so as to be completely surrounded and gripped by such muscle tissue to effect further closure of said passage, said opposed surface portions having substantially the same area when projected onto a plane transverse to the longitudinal axis of said body so that oppositely directed and substantially balancing forces are exerted thereon by the uterine muscle tissue to effect axial fixation of the device, and said elongate connection means having a diameter in the range of about 2–6 mm and which, with respect to the diameter of each of said bulbous portions is in the range of 0.4:1 to 0.8:1 so that both gripping of the connection means by the uterine muscle tissue and axial fixation are preserved.

4,537,187

EARPLUG

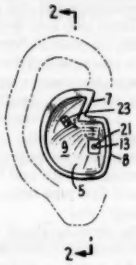
Robert T. Scott, 416 Lighthouse Ave., Santa Cruz, Calif. 95060

Filed Oct. 6, 1983, Ser. No. 539,483

Int. Cl.³ A61F *11/02*

U.S. Cl. 128—151 **2 Claims**

1. An earplug having thin walls and having an external flange adapted to engage the pinna helix and tragus of the ear and with an inwardly extending conical portion adapted to fit into the concha and outer portion of the auditory canal, terminating in a rectangular knob with a flat substantially solid wall with a small hole in said wall, and with a small flange thereon, said knob sealing off the meatus of the external ear canal without substantially penetrating the external ear canal, said flange anchoring the plug at the entrance of the external ear canal, said plug being made of a soft plastic with a density of less than 1.



4,537,188

GAS JET DEVICE FOR USE IN RESPIRATORS

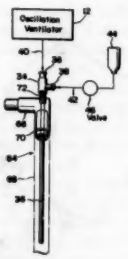
Tran N. Phuc, Ohmiya, Japan, assignor to Senki Medical Instrument Mfg. Co., Ltd., Tokyo, Japan

Filed Jan. 24, 1983, Ser. No. 460,652

Claims priority, application Japan, Jan. 26, 1982, 57-8906[U]

Int. Cl.³ A61M *16/00*

U.S. Cl. 128—200.21 **3 Claims**



1. In a humidified respiratory gas jet device for injecting in a humidified state into a patient circuit a respiratory gas supplied from an oscillation ventilator, the improvement which comprises:

an oscillation ventilator constructed and arranged for providing an oscillating supply of ventilating gas; and

a gas jet device operatively connected to said oscillation ventilator, said gas jet device including:

(a) a connecting member having:

a first inlet adapted to be connected to a water source to receive water,

a second inlet connected to said oscillation ventilator to receive an oscillating stream of respiratory gas therefrom.

a first water passage formed in said connecting member, opening at one end thereof, said first water passage being substantially straight,

a second water passage connecting another end of the first water passage to said first inlet, and

a gas passage formed in said connecting member to communicate at one end thereof to the second inlet and at another end to the first water passage, said gas passage being substantially straight and in alignment with said first water passage;

(b) a first straight pipe connected at one end to said first water passage to receive water therefrom;

(c) a second straight pipe connected at one end to said gas passage, said second straight pipe and said gas passage being arranged to form a straight gas conduit for transporting the respiratory gas and having another end portion coaxially fitted into said first straight pipe to form an annular humidifying conduit between an inner wall of the first pipe and an outer wall of the second pipe for conducting the water from the water source, said other end of said second straight pipe being axially inwardly spaced from said other end of said first straight pipe;

said one end of said second pipe being sealingly fitted into said gas passage to pass through the gas passage to thereby directly communicate with said second inlet; and

said one end of said first pipe being securely fitted into said first water passage; and

(d) the ratio of the cross-sectional area of said straight gas conduit to the cross-sectional area of said humidifying conduit being 4:1 to 8:1 at said other end of said second pipe, the cross-sectional area of said straight gas conduit at said other end of the second pipe being within the range of about 0.75 mm^2 to about 2.90 mm^2.

4,537,189

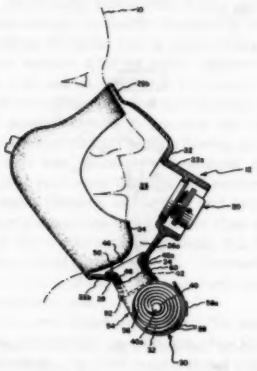
BREATHING DEVICE

Reno L. Vicenzi, Riverside, Calif., assignor to Figgie International Inc., Willoughby, Ohio

Filed Sep. 22, 1983, Ser. No. 534,792

Int. Cl.³ A62B *7/00*

U.S. Cl. 128—202.13 **12 Claims**



1. A breathing device comprising:

a face portion which is adapted to be spaced away from the face of a wearer of the breathing device to provide a breathing cavity within the interior of the face portion, said face portion being provided with inlet means for directing breathing gases into said breathing cavity, exhaust means for directing exhaust gases from said breathing cavity, said face portion further including an aperture therein adapted to be located adjacent the chin of the wearer

sealing means interconnected with the face portion and capable of providing a seal to prevent the ingress of ambient gases into the breathing cavity of the egress of breathing gases from the breathing cavity other than through said inlet means, said exhaust means and said aperture, said sealing means being adapted to contact the bridge of the nose, cheeks, and chin of the wearer;

a disposable effluent receiver comprising a container having one end removably secured to the exterior of the face portion and fluidically connected to said aperture; and

one-way valve means operatively mounted for permitting effluent material and/or gases to flow in one direction from the breathing cavity into the effluent receiver and for preventing the effluent material and/or gases within the receiver from flowing in the other direction into the breathing cavity.

4,537,190

PROCESS AND DEVICE FOR CONTROLLING ARTIFICIAL RESPIRATION

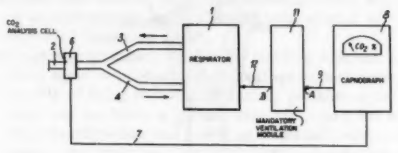
Luc Caillot, Paris, and Claude Chopin, Attiches, both of France, assignors to SYNTHELABO, Paris, France

Filed Dec. 7, 1982, Ser. No. 447,584

Claims priority, application France, Dec. 11, 1981, 81 23193

Int. Cl.³ A61M *16/00*

U.S. Cl. 128—204.22 **7 Claims**



4. Device for controlling the starting and stopping of an artificial respirator for a patient who had been completely assisted by the artificial respirator, and for helping the patient to recover natural respiration, comprising: an artificial respirator (1) with an inhalation line (3) and an exhalation line (4), a line common to both said inhalation and exhalation lines, a cell (6) for analysing the CO_2 content of the gas which passes through it, said cell being placed in said line common to inhalation and to exhalation, a control module (11), and a capnograph (8) coupled between the cell and the control module and converting the signals received from the cell in order to deliver converted signals to said control module, said control module (11) being coupled between the capnograph and the respirator and receiving these signals from the capnograph in order to control the starting and stopping of the respirator, the module being arranged so as to control the starting and stopping of the respirator as a function of the CO_2 content, measured at the end of each exhalation, of the gas exhaled, such that the respirator is turned on when the CO_2 content measured at the end of each expiration is outside of predetermined upper and lower limits for a predetermined period of time to provide controlled ventilation for the patient, and turned off when the CO_2 content measured at the end of each expiration is within said limits to provide for spontaneous ventilation of the patient.

4,537,191

PUMP ELEMENT OF A DEVICE FOR ARTIFICIAL RESPIRATION

Hans C. Blumensaadt, Virum, Denmark, assignor to Gottlieb Weinmann Geräte für Medizin und Arbeitsschutz G.m.b.H. & Co., Hamburg, Fed. Rep. of Germany

PCT No. PCT/EP81/00167, § 371 Date Jun. 20, 1983, § 102(e) Date Jun. 20, 1983, PCT Pub. No. WO83/01386, PCT Pub. Date Apr. 28, 1983

PCT Filed Oct. 21, 1981, Ser. No. 505,910

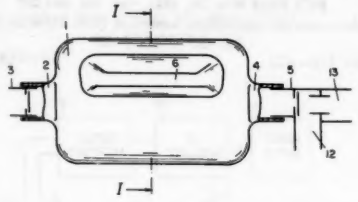
Int. Cl.³ A61M *16/00*

U.S. Cl. 128—205.13 **7 Claims**

1. A manually-operated pump element of a device for artificial respiration of human beings safely both as to children as well as adults having different lung capacity for volume of air to be supplied free of danger and without risk of pressure-overloading to lungs, respectively; said pump element comprising in combination:

a gastight, elastomeric, self-expanding hollow body having a periphery and an essentially circular cross section; said hollow body including a wall having only two actual

indentations integrated therein which extend in the axial direction of said hollow body; said two indentations, when viewed on a given cross section of said hollow body, being separated from one another by an angle in a range of approximately 100° to 140° as a result of which said hollow body can be grasped via the palm of the hand, and the fingers span the periphery of said hollow body by



engagement therewith rather than visually so that when said hollow body is compressed manually, such hollow body thus being emptied either approximately one third or two thirds for children as well as adults respectively;

a first tubular connecting piece joined to said hollow body as an air-inlet opening; and

a second tubular connecting piece joined to said hollow body as an air-exit opening.

4,537,192

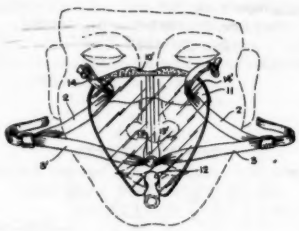
UNITARY ENDOTRACHEAL TUBE HOLDER

Billy R. Foster, 1040 Glenn Common, Livermore, Calif. 94550

Continuation of Ser. No. 167,419, Jul. 11, 1980, Pat. No. 4,331,143. This application Jun. 14, 1982, Ser. No. 388,210

Int. Cl.³ A61M *25/00*

U.S. Cl. 128—207.17 **9 Claims**



1. An endotracheal tube holder, comprising:

a support member having an integral body adapted to fit over the oral-nasal region of the patient's face, said body having wall means adapted to be place over, and upwardly supported by, the nose of the patient said wall means having a lower peripheral edge spaced from the patient's face, and further having holding means formed in the lower portion of said peripheral edge adapted to firmly engage and hold in place an endotracheal tube in a substantially perpendicular direction to the oral cavity for delivery of vapors to and from the patient's lungs, said holding means being formed such that said tube may be introduced laterally into said holding means; and

attachment means for attaching said support member to the patient's face, holding said support member firmly in place against the patient's nose and providing lateral support to said support member, including a main strap having opposite ends adapted to extend around the back of the patient's head, the two ends of said main strap being attached to either side of said support member, whereby said support member is maintained in place, and two supplemental straps having opposite ends, one end of each supplemental strap being attached to said support member at an elevational level different from the points of attachment of said main strap, the opposite ends of each supplemental strap being further connected to said main strap at positions on opposite sides of said support member, whereby said support member is provided further mechanical stability.

4,537,193

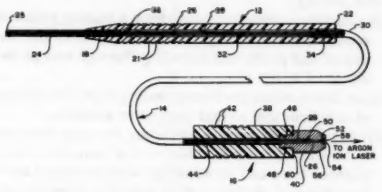
LASER ENDOCOAGULATOR APPARATUS

Howard M. C. Tanner, Salt Lake City, Utah, assignor to HGM, Inc., Salt Lake City, Utah

Filed Oct. 28, 1982, Ser. No. 437,288

Int. Cl.³ A61B *17/36;* **A61N** *5/00*

U.S. Cl. 128—303.1 **2 Claims**



1. A disposable endocoagulator apparatus adapted for connection to an argon laser having a female receptacle providing a laser output suited to optical fiber transmission for ophthalmic surgery and like procedures, comprising:

(a) an elongated, cylindrical-shaped handtool formed as a integral, plastic molded structure having:

(i) a cylindrical, pencil-like body having a leading end and a trailing end;

(ii) a tip portion formed integral with said body leading end and tapered towards the leading end of said body;

(iii) a central bore extending through the length of said handtool body and tip portion;

(iv) within said tip portion a first enlarged bore concentric with said central bore for mounting a probe;

(v) within the trailing end of said body a second enlarged bore concentric with said central bore for receiving a first optical fiber sheath; and

(vi) within said body an annular shoulder surrounding and concentric with said central bore and extending within said body between said shoulder and said second enlarged bore a third enlarged bore substantially equal in size to the size of said first enlarged bore and concentric with said central bore for receiving a second optical fiber sheath;

(b) a hollow, elongated, stainless steel tube forming a laser probe, said probe having a minor portion of the length thereof anchored in said tip portion first enlarged bore and having a major portion of the length thereof extending outwardly from said tip portion to a leading end, the axis of said probe being aligned with the axis of said handtool;

(c) a fiber optics connector assembly comprising:

(i) an elongated, cylindrical-shaped, integral, plastic-molded body member having a leading end and a trailing end and having a central bore through the length thereof and a fourth enlarged bore at the trailing end thereof concentric with said body member central bore, said body member having a flat annular surface at the trailing end thereof surrounding said body member fourth enlarged bore; and

(ii) a cylindrical, precisely-formed, male plug member having a leading end and a trailing end and positioned at the trailing end of and forming an integral connector structure with said body member, said plug member having a cylindrical portion of reduced diameter at its leading end and being secured to said body member by said plug member leading end of reduced diameter being inserted and secured in said body member fourth

enlarged bore, the trailing end of said plug member being tapered for guiding said male plug member into said female receptacle, said plug member having a bore aligned with and forming a continuation of the central bore of said body member and at the trailing end of said plug member an inwardly tapered recess around the plug member bore, the diameter and length of said male plug member being adapted for precise alignment and positioning within a mating argon laser female receptacle having an output source oriented along an axis aligned with the axis of said male plug member when inserted in said female receptacle, said flat annular surface serving as a stop for controlling the depth of said plug member in said receptacle; and

(d) a single, continuous length of optical fiber, said optical fiber having:

(i) a leading portion extending from a leading polished end surface positioned slightly outwardly from the leading end of said probe and extending through said probe and handtool bore;

(ii) an intermediate portion extending from the trailing end of said handtool to said connector assembly;

(iii) a trailing end portion extending through said connector assembly body member central bore and said plug member bore and terminating with a trailing end surface disposed slightly within said plug member recess;

(iv) a first cladding sheath extending over said length of optical fiber from a location slightly behind the leading polished end thereof to a location within said plug member and forwardly of said recess; and

(v) a second plastic sheath anchored in said connector assembly body member central bore at one end and surrounding said optical fiber and extending to and anchored in said second enlarged bore at the trailing end of said handtool.

4,537,194

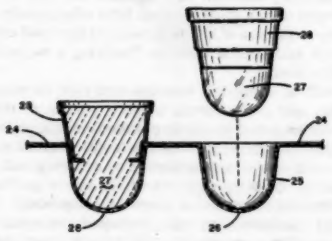
ICE APPLICATOR FOR MEDICINAL PURPOSES

Oliver D. Hanson, 2255 Viking Bldg. NW., Cedar, Minn. 55011; Donald R. Nicolai, Box 415, and Les O. Strong, 240 Mississippi, both of Monticello, Minn. 55362

Filed Mar. 12, 1984, Ser. No. 588,505

Int. Cl.³ A61F 7/00

U.S. Cl. 128—399 **11 Claims**



1. An applicator assembly for making, storing and applying a frozen solid to an injured area comprising first container means and second container means; said first container means having an open top of a predetermined size, a tapered side wall and a bottom of a size less than said predetermined size and having a central opening therethrough; said second container means having a shape conforming at least in part to the shape of said first container means and including a closed bottom, a side wall and a top with an opening of a size which will allow a top portion of the second container means to be slipped over a bottom portion of the first container means and to engage the side wall of the first container means a predetermined distance above the said bottom of said first container forming a seal.

4,537,195

ELECTRICAL CONTROL OF BODY DISCHARGES AND HEADACHES

Roy E. McDonnell, 15 Miller St., O'Connor, Capital Territory 2601, Australia

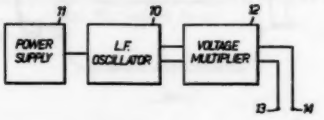
PCT No. PCT/AU81/00167, § 371 Date Jul. 16, 1982, § 102(e) Date Jul. 16, 1982, PCT Pub. No. WO82/01656, PCT Pub. Date May 27, 1982

PCT Filed Nov. 20, 1981, Ser. No. 403,497

Claims priority, application Australia, Nov. 20, 1980, PE6562

Int. Cl.³ A61N 1/36

U.S. Cl. 128—422 **10 Claims**



1. A method for controlling discharge from a stoma comprising:

(a) winding a length of muscle around the intestine connected to the stoma in the region adjacent to the stoma;

(b) applying a pair of mutually spaced electrodes to the skin in the region of the length of muscle; and

(C) applying to the electrodes a continuous electrical signal at a voltage in the range 20 volts to 60 volts and at a frequency in the range 10 Hz to 80 Hz,

whereby the length of muscle is caused to contract around the intestine and effectively prevent discharge through the stoma.

4,537,196

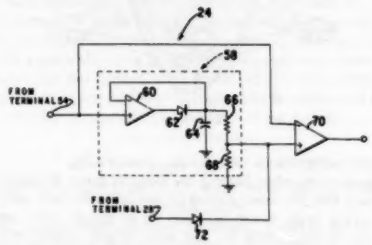
SYSTEMS AND METHODS FOR PROCESSING PHYSIOLOGICAL SIGNALS

Patrick G. Phillipps, Wayland, and Jeffrey Schenkel, Norwood, both of Mass., assignors to American Home Products Corporation (Del.), New York, N.Y.

Filed Dec. 21, 1981, Ser. No. 333,088

Int. Cl.³ A61B 5/00

U.S. Cl. 128—630 **13 Claims**



1. A system for detecting the recurrence of a periodic physiological function comprising:

an input terminal for receiving a physiological signal representing the function, the physiological signal having periodic artifact;

threshold producing means coupled with the input terminal to receive the physiological signal for producing a minimum threshold amplitude proportional to the fundamental frequency of the periodic artifact;

filtering means coupled with the input terminal to receive the physiological signal for suppressing the periodic artifact in the physiological signal to produce a filtered means signal therefrom; and

threshold detecting means operable for maintaining a threshold level equal to at least the minimum threshold amplitude and for producing a recurrence signal representative

of the recurrence of the physiological function in response at least in part to the filtered signal exceeding the threshold level.

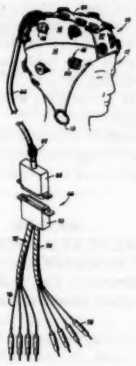
4,537,197
DISPOSABLE FETAL OXYGEN MONITOR
Jaroslav F. Hulka, 2317 Honeysuckle Rd., Chapel Hill, N.C. 27514
Filed Mar. 6, 1981, Ser. No. 241,433
Int. Cl.³ A61B 5/00
U.S. Cl. 128—633 **3 Claims**

1. Surgical equipment comprising an obstetrical scalp cap of soft flexible plastic to be attached to a fetal scalp incidental to monitoring oxygenation of the fetal brain tissue, said cap having on its inner surface one or more recesses communicating with a port in the cap by which vacuum may be delivered thereto to hold the scalp cap in place at the time of expected delivery, said scalp cap including a pair of apertures at the inner surface, and a comolded catheter on the outside of the cap, said catheter having a channel for communicating vacuum to said port and having a pair of channels respectively accommodating fiber optic bundles by which a beam of light may be transmitted to the fetal brain through one of said pairs of apertures and reflected back through the other.

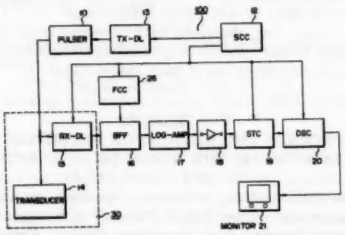
4,537,198
ELECTRODE CAP
Sue Corbett, 901 Harvard Pl., Woodland, Calif. 95695
Filed May 3, 1983, Ser. No. 491,238
Int. Cl.³ A61B 5/04
U.S. Cl. 128—639 **24 Claims**

1. An electrode cap comprising:
a flexible helmet including:
a pair of opposed side portions adapted for positioning at particular locations on the head of a patient;
a flexible crown flap connected to said side portions; and
means for detachably engaging the crown flap to said opposed side portions to position the helmet upon the head of an individual;
a plurality of spaced electrode anchoring tabs positioned at least partially inside the helmet and arrayed over a major portion of the interior thereof, each of said tabs including attaching means adapted for removably attaching a pickup electrode to the respective one of said tabs;
a plurality of brain wave pickup electrodes movably located within the interior of the helmet, and each including means to selectively engage said attaching means of any selected one of said anchoring tabs at variable positions thereon; and
means for electrically connecting the electrodes to a recording means.

24. A pickup electrode useful for contacting a patient's head during electroencephalography comprising:
a contact adhering anchoring element having a central opening therethrough, including means for engagement, upon contact, with a helmet-carried anchoring tab;
an annular mounting plate having an opening through the center thereof;
a tubular boss projecting from one side of the mounting plate and having a bore therethrough aligned with the central opening through the mounting plate;
an annular metallic contact mounted between, and secured to, the anchoring element and the mounting plate and having a central opening aligned with the openings in the anchoring element, and in the mounting plate, and aligned with the bore through said tubular boss, said central opening in said metallic contact being of smaller diameter than the opening in said plate and than the diameter of the bore through said tubular boss, said metallic contact being located on the opposite side of said mounting plate from the side from which said tubular boss projects;
a closed cell resilient pad having a central opening therethrough receiving said boss; and
an electrical lead connected to said metallic contact.



4,537,199
ULTRASONIC DIAGNOSTIC APPARATUS
Yuuichi Muranaka, Ootawara, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan
Filed Feb. 22, 1984, Ser. No. 582,538
Claims priority, application Japan, Feb. 22, 1983, 58-26953; Mar. 10, 1983, 58-38226
Int. Cl.³ A61B 10/00
U.S. Cl. 128—660 **13 Claims**



1. An ultrasonic diagnostic apparatus for displaying a tomographic image of an object to be investigated, the apparatus comprising:
a transducer means, including an array of ultrasonic vibration elements, for applying beams of ultrasonic waves into

the object at preselected steering angles, receiving ultrasonic echo signals reflected from the object, and converting the received echo signals into electric echo signals;

transmitter means coupled with said transducer means for applying timed electric pulses to the array of ultrasonic vibration elements in a manner that produces beams of ultrasonic waves deflected at preselected steering angles;

a variable gain amplification means coupled with said transducer means for receiving electric echo signals from said transducer means and selectively amplifying the received electric echo signals;

signal means for producing signals representative of the steering angle of each respective ultrasonic beam;

a gain sensitivity control means responsive to the deflection angle of the respective ultrasonic beams and coupled with said signal means and said variable gain amplification means for increasing the gain of the variable gain amplification means as the steering angle of the respective ultrasonic beams increases; and

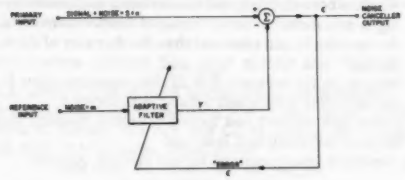
display means coupled with said variable gain amplification means for converting the amplified echo signals into a tomographic image of the object being investigated.

4,537,200

ECG ENHANCEMENT BY ADAPTIVE CANCELLATION OF ELECTROSURGICAL INTERFERENCE

Bernard Widrow, Stanford, Calif., assignor to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Jul. 7, 1983, Ser. No. 512,191
Int. Cl.³ A61B 5/04
U.S. Cl. 128—696 **11 Claims**



1. In a patient monitoring system, means for improving the signal-to-noise ratio, comprising

(a) means for detecting primary signals from a patient comprising a desired signal and a noise signal,

(b) means for detecting a reference signal from the patient comprising substantially only said noise,

(c) means for filtering said patient originated signals; and

(d) adaptive filter means comprising

(i) adaptive means responsive to the reference signal for continuously generating a reference noise signal comprising an estimate of the noise in the primary signal received at an input of said adaptive filter; and

(ii) means for subtracting said reference noise signal from said primary patient originated signal to provide an accurate representation of said desired signal.

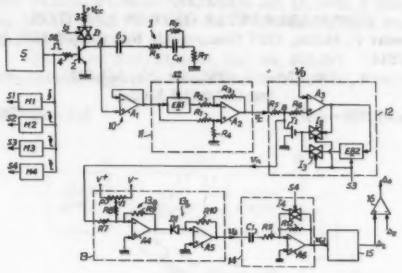
4,537,201

PROCESS AND DEVICE FOR DETECTING THE RESPONSE OF THE HEART TO AN ELECTRICAL STIMULATION PULSE

Daniel Delle-Vedove, Aulnay sur Mauldre; Yves Lallemand, Vernon, and Olivier Hubert, Paris, all of France, assignors to Societe Europeenne de Propulsion, Puteaux, France

Filed Sep. 9, 1983, Ser. No. 530,522
Claims priority, application France, Sep. 23, 1982, 82 16034
Int. Cl.³ A61B 5/02; A61N 1/36
U.S. Cl. 128—697 **13 Claims**

1. Process for detecting the response of the heart to an electrical stimulation pulse applied to an electrode in contact with the heart, by detection in a signal representing the potential of said electrode of a component produced by the provoked contraction of the heart, comprising the following steps of:



collecting, after the end of the stimulation pulse, a first signal v which represents the electrode potential in open circuit and of which the variation in time t, from an original instant t_o is of substantially logarithmic form:

$$v = v_o + k \text{Log} \frac{t}{t_o},$$

v_o being the value of v at instant t_o and k being a parameter connected in particular with the duration and amplitude of the stimulation pulse,

converting the first signal v into a second signal of which the variation in time is substantially linear and,

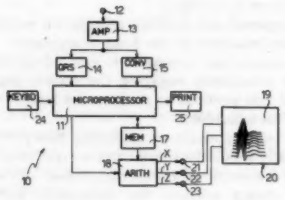
detecting in said second signal a non-linear component representing the signal produced by the provoked contraction of the heart.

4,537,202

DEVICE FOR DISPLAYING ELECTRICAL SIGNALS OF THE PERIODIC AND/OR SYNCHRONIZABLE TYPE

Paolo Mancini, Pisa; Alessandro Taddei, Uzzano; Alberto Macerata, and Carlo Marchesi, both of Pisa, all of Italy, assignors to Remco Italia S.p.A., Milano, Italy

Filed Aug. 30, 1982, Ser. No. 412,576
Claims priority, application Italy, Sep. 2, 1981, 68161 A/81
Int. Cl.³ A61B 5/04
U.S. Cl. 128—712 **16 Claims**



1. A device for displaying periodic synchronisable electrical signals comprising:

input means for receiving an electrical signal to be displayed;

first memory means (17) for sequentially memorizing samples of said signal to be displayed;

recognition means (14) connected to said input means for generating a synchronization signal upon recognizing a correspondence between said signal to be displayed and said predetermined pattern;

microprocessor means (11) connected to said recognition means (14) and to said first memory means for (17) causing said first memory means (17) to store a predetermined signal and causing a plurality of cycles of the signal to be displayed to be identified in said memory upon receipt of each said synchronization signal;

processor means (18) connected to said first memory means (17) and to said microprocessor means (11) for generating horizontal and vertical cathode ray tube deflection signals from said memorized samples of said signal to be displayed for each of said identified cycles;

said processor means (18) including first comparator means (42) for comparing a reference signal with said stored predetermined signal and for generating a cathode ray tube horizontal axis synchronization output signal (x) when said stored predetermined signal is equal to said reference signal;

said processor means (18) including a horizontal deflection signal generator (52), said output signal of said first comparator (42) connected to a zeroing input of said horizontal deflection signal generator;

said processor means (18) further including a threshold comparator (57) having input means, a first of said threshold comparator inputs provided by the output of said horizontal deflection generator (52) and a second of said threshold comparator inputs supplied with a signal having an adjustable amplitude, the output of said threshold comparator connected to said zeroing input;

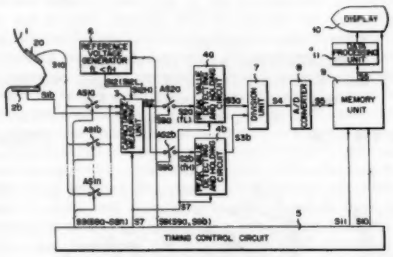
a cathode ray tube (20) including a screen (19) connected to said processor means;

whereby a perspective, juxtaposed, representation of the wave form corresponding to said identified cycles is displayed on said screen.

4,537,203
ABNORMAL CELL DETECTING DEVICE

Kaoru Machida, Otawara, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 311,911, Oct. 16, 1981, abandoned. This application Jun. 25, 1984, Ser. No. 623,549
Claims priority, application Japan, Oct. 21, 1980, 55-147408
Int. Cl.³ A61B 5/05
U.S. Cl. 128—734 **6 Claims**



1. A method for detecting an abnormal cell, comprising the steps of:

attaching at least a pair of electrodes to a portion of a body to be measured, at least one electrode of said pair being formed of a plurality of electrode cells;

supplying each of said electrode cells with first and second voltages having different frequencies between said electrodes;

independently detecting from between each electrode cell of one electrode and the other electrode of said electrode pair, first and second impedance values, said values being obtained from the body portion being measured when the first and second voltages are supplied across said electrodes;

calculating a plurality of ratios by dividing the first and second impedance values obtained from each cell;

storing in a memory, at predetermined addresses corresponding to the locations of each of said electrode cells, the ratios calculated for each of said electrode cells during said calculating step;

determining the existence of an abnormal data representing said abnormal cell based upon said calculated ratios;

selecting the address of said memory at which said abnormal data is stored, so that said abnormal data is read out in accordance with the selected address;

producing an image data corresponding to said abnormal cell based on the read-out abnormal data; and

displaying the produced image data in the form of various visual images,

said frequencies of the first and second voltages being selected so as to border the range of dispersion of frequency-specific inductive capacity of the cells of said body portion, whereby a difference between the electrostatic capacitances measured at the body portion at the two frequencies is made great.

4,537,204
METHOD OF TOBACCO TREATMENT TO PRODUCE FLAVORS

Helmut Gaisch, Cormondreche, Switzerland; Patrick D. L. Ghiste, Montbazin-Meze, France, and Dieter Schulthess, Neuchatel, Switzerland, assignors to Fabriques de Tabac Reunies S.A., Neuchatel, Switzerland

Filed Jan. 10, 1983, Ser. No. 456,868
Claims priority, application European Pat. Off., Jan. 9, 1982, 82100112
Int. Cl.³ A24B 3/12, 15/20
U.S. Cl. 131—274 **16 Claims**

1. A method for treating tobacco to produce flavors comprising the steps of:

(a) hydrolytically degrading into an amino acid mixture the proteins of biomass produced by the assimilation of low-molecular weight nitrogen compounds from an aqueous tobacco extract, with tryptophane being destroyed in the process to less than 0.01 percent by weight of said amino acid mixture; and

(b) converting the amino acid mixture into flavors, in the course of the Maillard reaction, by treating said mixture with reducing sugars and heat under continuous stirring, at a pH value of 3–12, for 1–200 hours, at a temperature of 20°–180° C., with a molar ratio of the amino acid mixture to the reducing sugar added between 4:1 and 1:4 in aqueous solution, with a solids content of 20–70 percent by weight and at a pressure of 1–5 atmospheres.

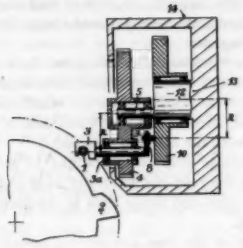
4,537,205
CUTTING GUIDE FOR CIGARETTE MAKING MACHINES

Jean Verjux, Montgeron, France, assignor to Decoufle S.A.R.L., Evry, France

Filed Sep. 20, 1982, Ser. No. 419,911
Claims priority, application France, Mar. 9, 1982, 82 03905
Int. Cl.³ A24C 5/28
U.S. Cl. 131—280 **4 Claims**

1. In a cigarette making machine: a first gear wheel rotatable about a first axis; a plurality of cutting guides; a plurality of shaft means respectively rotatably supporting said guides in said gear wheel about second axes evenly distributed over said gear wheel at a distance R from said first axis such that $2\pi R = nl$, in which l is the length of the cigarettes to be cut and n the number of cutting guides; a plurality of forks respectively connected to said shaft means remote from said guides; a plurality of rollers respectively engaged in said forks; a second gear wheel arranged parallel to and of the same size as said

first gear wheel and rotatable about a third axis; a plurality of shafts connected to said second gear wheel at said distance R



from said third axis and respectively connected to said rollers, and means for driving said gear-wheels.

4,537,206

APPARATUS FOR PERFORATING AND TESTING THE PERMEABILITY OF RUNNING WEBS OF CIGARETTE PAPER OR THE LIKE

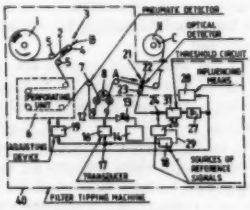
Heinz-Christen Lorenzen, Wentorf; Uwe Heitmann, Hamburg; Kurt-Eckart Petersen, Wentorf, and Peter Pinck, Gross-Hansdorf, all of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG., Hamburg, Fed. Rep. of Germany

Filed Sep. 27, 1982, Ser. No. 424,487

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1982, 3220594

Int. Cl.[3] **A24C** *5/56, 5/60*

U.S. Cl. 131—281 **12 Claims**



1. Apparatus for treating a running web of cigarette paper, tipping paper or the like, comprising means for advancing the web in a predetermined direction along a predetermined path; adjustable means for perforating the running web in a first portion of said path; first monitoring means for ascertaining the permeability of the perforated web in a second portion of said path, comprising means for generating first signals when the permeability of successive increments of the running web in said second portion of said path deviates from a preselected permeability; means for adjusting said perforating means in response to said first signals; second monitoring means for ascertaining the permeability of the perforated web in a third portion of said path, comprising means for generating second signals denoting the ascertained permeability of successive increments of the running web in said third portion of said path; a source of third signals denoting a predetermined permeability; and means for comparing said second signals with said third signals, including means for generating fourth signals when said second signals deviate from said third signals.

4,537,207

CALLOUS-REMOVING SKIN-FILE

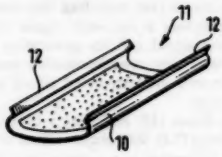
Heinz Gilhaus, Solingen, Fed. Rep. of Germany, assignor to Firma Credo Stahlwarenfabrik Gustav Kracht, Solingen, Fed. Rep. of Germany

Filed Mar. 28, 1983, Ser. No. 479,801

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1982, 3212274; United Kingdom, Apr. 29, 1982, 8212519

Int. Cl.[3] **A45D** *29/20*

U.S. Cl. 132—76.4 **17 Claims**



1. A callous-removing skin file, or rasp, comprising:

a longitudinally extending gripping handle having an inner and an outer end;

a rasp head extending from the inner end of said handle having an upper side, a lower side, and longitudinal edges extending parallel to the longitudinal axis of said handle, said longitudinal edges being thicker than the part of the rasp head between said edges;

grooveways in and extending substantially parallel to and along the outer sides of said longitudinal edges;

flanges along said edges forming limiting inner shoulder portions of said grooveways;

projecting shoulder portions at both ends of said rasp head forming end stops;

a filing or rasping foil member removably attached to said rasp head having a cutting surface and longitudinal edges with inturned portions releasably engaged in said grooveways in abutting relationship along the edges thereof with said flanges and at the ends thereof with said end stops so that said foil member is retained on and in fixed embracing relationship with said rasp head during use; and outwardly angled flanges along the edges of said foil member of the rasp.

4,537,208

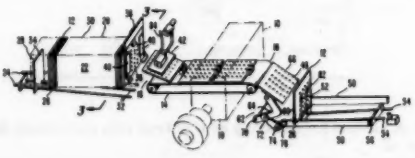
HORIZONTAL FLAT DESTACKER

Henry Y. Kuhl, Kuhl Rd., P.O. Box 26, Flemington, N.J. 08822

Filed Jul. 25, 1983, Ser. No. 517,122

Int. Cl.[3] **B08B** *3/00*

U.S. Cl. 134—124 **9 Claims**



9. A horizontal flat destacker comprising:

(a) a processing station for washing article carrying flats singly, said processing station including a processing conveyor means for moving single flats through said processing station, said processing station including an inlet area and an exit area with said processing conveyor means adapted to move flats from said inlet area thereof to said exit area thereof;

(b) a horizontal flat supply means adapted to supply a stack of flats oriented extending horizontally to said inlet area of said

processing station, said horizontal flat supply means comprising:

(1) a supply conveyor means traveling toward said processing station and adapted to receive a horizontally extending stack of flats with the edges of the flats resting upon said supply conveyor means to facilitate conveying same toward said processing station;

(2) a supply biasing means positioned in abutment with the bottommost flat of a horizontally extending stack of flats to urge the stack toward said processing station, said supply biasing means including a supply bar means extending longitudinally with respect to said supply conveyor means and a supply biasing member in abutment with the bottommost flat of the horizontally extending stack and movably mounted upon said supply bar means to allow free longitudinal movement thereof with respect to said bar means, said supply bar means being inclined downwardly toward said processing station to cause said supply biasing member to urge the horizontal stack of flats toward said processing station by gravitational force urging said supply biasing member to move downwardly on said supply bar means;

(c) a flat transfer means for moving onto the processing conveyor means a single uppermost flat of the horizontally extending stack thereof located upon said horizontal flat supply means, said flat transfer means comprising:

(1) a supply retaining means for resiliently retaining the uppermost flat of a horizontal stack upon said horizontal flat supply means, said supply retaining means including resiliently biased pivotally movable door member;

(2) a transfer arm movable between a pick-up position adjacent to the horizontally extending stack of flats on said horizontal flat supply means and a placement position adjacent said inlet area of said processing conveyor means, said transfer arm adapted to abut and releasably vacuum grip the uppermost flat in the pick-up position and overcome said supply retaining means by opening of said resiliently biased pivotally movable door members to move the uppermost flat to said inlet area of said processing conveyor means by release thereof when in said placement position;

(d) a horizontal flat restacking means adjacent to said exit area and adapted to receive flats from said processing station for restacking in a horizontal orientation, said horizontal flat restacking means including stack support rails for abutting the lower edge of each flat of the horizontally extending stack for support thereof, said horizontal flat restacking means also including a restacking biasing means comprising a restacking bar means extending longitudinally along said stack support rails and a restacking biasing member comprising two vertically extending rods mounted upon said restacking bar means with freedom of longitudinal movement therealong, said restacking biasing member adapted to abut the uppermost flat of the horizontal stack thereof positioned on said horizontal flat restacking means, said restacking bar means being inclined downwardly toward said processing station to cause said restacking biasing means to urge the horizontally extending stack of flats toward said processing station, said horizontal flat restacking means including a resilient holding means secured with respect to said stack support rails and adapted to resiliently bias and hold the edges of the lowermost flats positioned on said horizontal flat restacking means, said resilient holding means comprising flexible plastic members, said horizontal flat restacking means further including a limit switch means operable to be activated responsive to the maximum flat capacity of said horizontal flat restacking means;

(e) a flat removal means positioned between said exit area of said processing station and said horizontal flat restacking means to move individual flats from said processing conveyor means to the bottom of the horizontal stack positioned on said stack support rails, said flat removal means including:

(1) a removal arm pivotally mounted with respect to said processing station and said horizontal flat restacking means and movable from a removal position adjacent to said exit area of said processing station to a restacking position adjacent to the lowermost flat of the horizontal stack located thereon, said removal arm when in the removal position adapted to remove a single flat exiting the processing station for being carried to said horizontal flat restacking means for placement onto the bottom of the stack of flats thereon;

(2) a cam follower means secured with respect to said removal arm; and

(3) a camming means rotatably mounted with respect to said flat removal means and adapted to abut said cam follower means to cause and control movement of said removal arm from the removal position to the restacking position and vice versa.

4,537,209

DEVICE FOR CLEANING ENDOSCOPES

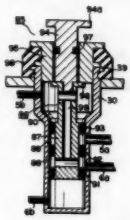
Hiroyuki Sasa, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 13, 1983, Ser. No. 541,423

Claims priority, application Japan, Oct. 15, 1982, 57-180827

Int. Cl.³ B08B 9/02

U.S. Cl. 134—166 C **6 Claims**



1. A device for cleaning an endoscope comprising an insert section which is inserted into a body cavity from a front end thereof; an operation section connected to a base end of the insert section; an air and water supply cylinder arranged in the operation section; a changeover piston slidable in the cylinder and detachable from the cylinder; an air supply passage having a lower side portion, one end of which is opened at the front end of the insert section while the other end thereof is communicated with the cylinder, and an upper side portion, one end of which is communicated with the cylinder while the other end thereof is connected to a means for supplying air; a water supply passage having a lower side portion, one end of which is opened at the front end of the insert section while the other end thereof is communicated with the cylinder, and an upper side portion, one end of which is communicated with the cylinder while the other end thereof is connected to a means for supplying water; an instrument inserting channel; a suction cylinder arranged in the operation section; a changeover piston slidable in the suction cylinder and detachable from the suction cylinder; and a suction passage having an upper side portion, one end of which is opened at the front end of the insert section, said suction passage being connected halfway thereof to the instrument inserting channel, and the other end of the suction passage being communicated with the suction cylinder, and said suction passage having a lower side portion, one end of which is communicated with the suction cylinder while the other end thereof being connected to a means for producing suction; said device comprising

a communication member inserted into the air and water supply cylinder after removing the changeover piston from the cylinder to communicate at least one of the combinations consisting of the upper side portion of the water supply passage and the lower side portion of the air supply passage, and consisting of the upper side portion of the water supply passage and the suction passage;

said communication member being inserted to move in the air and water supply cylinder between first and second positions and having a changeover mechanism which allows the upper side portion of the water supply passage to be communicated with the lower side portion of the air supply passage when said communication member is in the first position; and said changeover mechanism allows the upper side portion of the air supply passage to be communicated with the lower side portion of the air supply passage when said communication member is in the second position.

4,537,210

SHELTER

Rodney L. Montgomery, 4 Kellaway St., Darwin, Australia

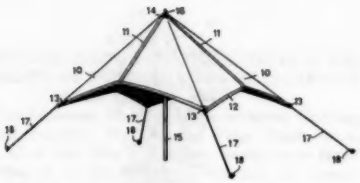
PCT No. PCT/AU82/00048, § 371 Date Dec. 6, 1982, § 102(e) Date Dec. 6, 1982, PCT Pub. No. WO82/03317, PCT Pub. Date Oct. 14, 1982

PCT Filed Apr. 5, 1982, Ser. No. 448,902

Claims priority, application Australia, Apr. 6, 1981, PE8327

Int. Cl.³ A45F *1/00*; E04B *1/347*

U.S. Cl. 135—87 **3 Claims**



1. A shelter including:

a cover having substantially rectangular corner sections of fabric which is unstable on the bias,

means for supporting the cover at the innermost corners of the corner sections,

tensioning means,

attachment means for attaching the tensioning means to the outermost corners of the corner sections to stretch such corner sections on the bias in a downward direction relative to the point or points at which the shelter cover is supported,

a reinforced eye in said corner opposite said stretched corner sections,

a central support pole for supporting the inner corners of the rectangular sections, said pole having means at the top which engages closely in said eye; and

adjacent sections of the cover being joined along lines reinforced by strips of flexible material resistant to stretch extending from said reinforced eye to substantially the outer edge of said sections, said pole, reinforced eye and strips keeping the innermost corners and sides of the rectangular sections adjacent thereto relatively undeformed and linear while the outermost corners are stretched on the bias to stretch the outermost sides of the rectangular section so as deform the rectangular sections into a substantially offset diamond shape.

4,537,211

APPARATUS FOR IMPROVING OIL STORAGE TANKS

Robert Almeida, 29 Overhill Rd., Scarsdale, N.Y. 10583

Filed May 17, 1983, Ser. No. 495,247

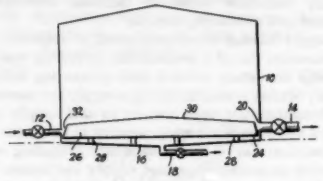
Int. Cl.³ F17D *1/00*

U.S. Cl. 137—1 **16 Claims**

1. Apparatus for decreasing a quantity of oil held as deadstock in an oil storage tank having a top, bottom, and sides, an oil inlet pipe, and an oil delivery pipe located above the level of the bottom of the tank, the apparatus comprising:

positive volume displacement means for displacing a predetermined volume of oil including a tray having a solid, substantially flat bottom and upraised sides for retaining therein a quantity of material substantially inert to oil;

means for arranging said tray adjacent said bottom at a



location determined by a lowermost edge and an uppermost edge of said oil delivery pipe; and

means for preventing occlusion of said oil delivery pipe and for maintaining a quantity of oil at least above an uppermost edge of said oil delivery pipe.

4,537,212

METHOD AND SYSTEM FOR TANK OVERFILL PROTECTION

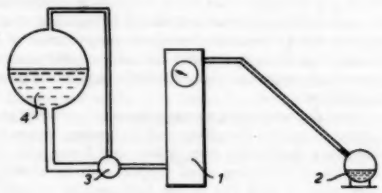
Colin C. Rogers; John N. Baker, and Joseph Estebanez, all of Chester, England, assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 12, 1983, Ser. No. 560,095

Claims priority, application United Kingdom, Dec. 31, 1982, 8237085

Int. Cl.³ B67D *5/372*

U.S. Cl. 137—2 **16 Claims**



1. A method for preventing the overfilling of an LPG tank comprising:

supplying LPG fuel to said tank while measuring the pressure and flow rate of said LPG fuel;

determining for equal time intervals the tank pressure using the measured pressure and flow rate of said LPG fuel;

determining from said tank pressures the rate of increase of the tank pressure with respect to time;

comparing said determined rate of increase of tank pressure with a preselected rate of increase of tank pressure; and

shutting off the LPG fuel if said determined rate exceeds said preselected rate and said flow rate is less than a preselected flow rate.

4,537,213

DOUBLE FLAPPER CHECK VALVE

Domingo F. Molina, 1008 Hickory, Colorado City, Tex. 79512

Filed Aug. 27, 1984, Ser. No. 644,616

Int. Cl.³ F16K *17/12*

U.S. Cl. 137—269.5 **2 Claims**

1. A reversible check valve for a pipeline having a horizontal longitudinal axis comprising:

a. a housing divided into

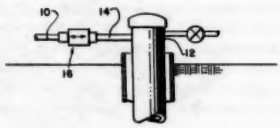
b. an upstream chamber and

c. a downstream chamber,

d. each chamber having a top and bottom,

e. a horizontal tube connecting the chambers,

f. said tube extending in the direction of the pipeline axis,
g. a valve seat on the tube in each of the chambers,
h. each valve seat having a top and bottom,
i. the valve seats being parallel,
j. the bottom of the downstream valve seat extending into the downstream chamber further than the top,
k. a downstream pivot pin extending transversely of the tube in the housing above the top of the downstream valve seat,
l. a downstream flapper valve on the downstream pivot pin adapted to seat on the valve seat,
m. so that the downstream flapper valve prevents fluid flow from the downstream chamber to the upstream chamber,



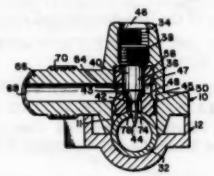
n. an upstream pivot pin extending transversely of the tube in the housing below the bottom of the upstream valve seat,
o. an upstream flapper valve on the upstream pivot pin adapted to lie on the bottom of the chamber below the bottom of the upstream valve seat,
p. the chambers and their contents of similar shape and arrangement, and
q. means for connecting the housing in the pipeline for rotating the housing upsidedown about the pipeline axis so that the top becomes the bottom and upstream becomes downstream.

4,537,214

SINGLE SEAL PIPELINE TAPPING FIXTURE HAVING SECURE VALVE

Arnold A. Cowan, Encino, Calif., assignor to Gem Products, Inc., Garden Grove, Calif.

Filed Nov. 19, 1984, Ser. No. 672,696
Int. Cl.³ F16K *43/00*
U.S. Cl. 137—318 **10 Claims**



1. An externally attachable and sealed pipeline system piercing valve comprising:

(a) upper and lower blocks having, respectively, lower and upper mating surfaces, said mating surfaces each having a positionally corresponding generally linear groove extending thereacross, said upper block having a generally cylindrical bore extending vertically therethrough and intersecting the grooved lower surface thereof, the upper section of said bore being adapted for receiving screw threads with the topmost section of said bore having a diameter less than that of the threaded upper section thereof, the lower section of said bore having a diameter greater than that of said upper section to define a sealing chamber, said upper block further having an access port extending therethrough and intersecting said bore along said lower section thereof;

(b) a cylindrical piercing needle having an upper threaded portion having a radial diameter suitable for engaging the threads of said bore, a coaxial central portion having a decreasing radial diameter, and a coaxial lower portion having means for tapping an access hole in said pipeline;

(c) a cylindrical unitary seal coaxially interposed in said sealing chamber between said piercing needle and the inner bore surface of said upper block, said seal extending above the intersection point of said access port with said bore and of a length to make sealing contact with the surface of the pipeline being pierced, said seal including an opening extending through the cylindrical wall thereof so as to permit the communication of a fluid from a point external to the mated upper and lower portions of said block into the region defined by the grooves thereof and said needle being adapted to seal and block communication between said access hole and said opening; and

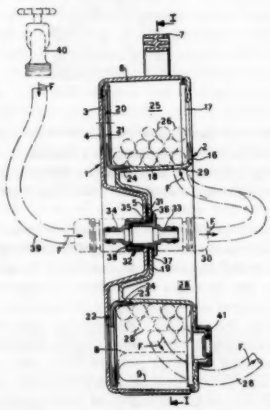
(d) means for clamping said upper and lower blocks together about said pipeline.

4,537,215

PORTABLE WINDING DEVICE FOR FLEXIBLE PIPE, PARTICULARLY FOR CARS, CARAVANS, COACHES, CRAFTS, BALCONIES AND SMALL GARDENS

Gianfranco Roman, Pasiano, Italy, assignor to Claber S.p.A., Flume Veneto, Italy

Filed Sep. 30, 1983, Ser. No. 537,715
Claims priority, application Italy, Apr. 13, 1983, 21519/83[U]
Int. Cl.³ B65H *75/34*
U.S. Cl. 137—355.26 **8 Claims**



1. A portable winding device for flexible pipe, comprising a fixed casing provided with gripping and hanging means and a drum rotatable on a support conduit, the drum shaped so as to define with said casing an annular housing for a flexible pipe which can be wound therein, the annular housing being provided with a first opening facing toward the center of the winding device for the passage of the receiving end of the pipe and a second opening facing outwards for the extraction of the distributing end of the pipe, the support conduit axially connecting the casing and the drum, the support conduit provided with a coupling at one end, capable of coupling to the flexible pipe, the support conduit provided with a second coupling at the opposite end capable of coupling to a fluid supply, each of the couplings being situated such that they are readily accessible from the exterior of the winding device, the casing further comprising a first plane annular member, a projecting central member supported on said support conduit and a circular peripheral wall disposed perpendicular to said annular member, the drum comprising a second plane annular member

spaced parallel to said first plane annular member, an annular wall disposed perpendicular to and spaced from said peripheral wall, a recessed central member receiving said projecting central member and rotatably supported on said support conduit.

4,537,216

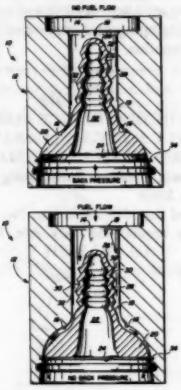
ANTI-KNOCK LIQUID FLOW CONTROL VALVE

Edwin Schwartz, 16604 Park Lane Pl., Los Angeles, Calif. 90049, and David Frees, 5407 Amestoy, Encino, Calif. 91316

Filed Jul. 13, 1984, Ser. No. 630,536

Int. Cl.³ F16K *15/00, 47/02*

U.S. Cl. 137—514 **1 Claim**



1. An improved shock absorbing, one-way liquid flow control valve, said valve comprising, in combination:

(a) a housing defining a passageway extending longitudinally therethrough, and a shoulder extending into said passageway;

(b) a hollow valve element comprising a main body having a longitudinal conduit extending therethrough, said valve element being disposed longitudinally in said valve passageway and having a seat portion of expanded diameter adapted to seat on said shoulder to seal said valve against liquid flow through said passageway, said valve element being longitudinally slideable in said passageway to unseat said expanded diameter portion from said shoulder and thereby open said valve, said valve element also including a bellows connected to said main body and sealing off said conduit, which bellows folds and unfolds longitudinally in response to pressure variations in said passageway, thereby absorbing and dampening shocks generated in said valve,

(c) wherein said bellows comprises a flexible generally inelastic sheet connected to said main body of said valve element, and

(d) wherein said bellows moves in response to back pressure from a position within said conduit to a position upstream of said valve element main body to effect shock absorbing dampening.

4,537,217

FLUID DISTRIBUTOR

Crowley C. Allen, Jr., Durham, N.C., assignor to Research Triangle Institute, Research Triangle Park, N.C.

Filed Dec. 9, 1982, Ser. No. 448,201

Int. Cl.³ F15D *1/14*

U.S. Cl. 137—561 A **14 Claims**

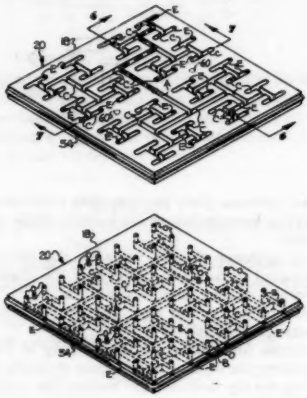
1. A fluid distributor characterized by providing a low resistance to flow thereacross and uniform distribution throughout the distribution surface thereof, said distributor comprising:

a distributor body defining first and second opposed exterior portions;

said first exterior portion including a fluid port;

said second exterior portion defining a two-dimensional distribution surface having a plurality of distribution openings so spaced as to be uniformly distributed over the surface area thereof;

means defined by interconnecting fluid passages in said distributor body, said means extending through said distributor body for providing communication between said fluid port and each of said distribution openings, and such that the fluid flow path between said fluid port and each of said distribution openings is of substantially uniform length and has similar geometric flow resistance characteristics so as to provide substantially the same resistance to flow therealong, said interconnecting fluid passages comprising a first set of passages formed in the face of said first exterior portion serving to subdivide the fluid flow from said fluid port and a second set of passages for delivering the subdivided flow from the first set to the distribution openings of the two-dimensional distribution surface.



4,537,218

HYDRAULIC DIRECTIONAL VALVE FOR CONTROLLING DOUBLE-ACTING MOTOR

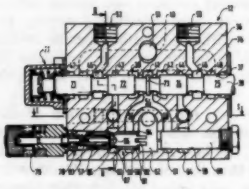
Wolfgang Kötter, Markgröningen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 13, 1984, Ser. No. 579,853

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1983, 3310863

Int. Cl.³ F15B *13/08*

U.S. Cl. 137—596.13 **9 Claims**



1. A hydraulic directional valve for controlling a double-acting motor, comprising a housing having a center and two

end sides; a longitudinal opening formed in said housing; a neutral circulating passage for flowing a pressure medium flow from a pump to a tank, said neutral circulating passage being formed symmetrically and having three chambers including a circulating chamber; a plurality of chambers formed in said housing and being in operative communication with said longitudinal opening, said chambers including two motor chambers, two supply chambers, and two return chambers; the control slider axially movable in longitudinal opening between a neutral position in which said control slider controls said neutral circulating passage and separates said two motor chambers from a respective one of said supply chambers and a respective one of said return chambers, and two working positions in which said control slider blocks said neutral circulating passage and connects one of said motor chambers with one of said supply chambers and the other motor chamber with one of said return chambers; an outwardly adjustable three-way flow regulating valve extending between a feed passage arranged in said housing and said supply chambers and supplying the latter with a constant stream, whereas its residual stream is supplied into one of said circulating chambers of said neutral circulating passage located downstream; two auxiliary openings extending in said housing parallel to said longitudinal opening from both end sides of the housing, a feed chamber arranged in the center of said housing so that said auxiliary openings extend into said feed chamber; a bridge passage extending from a central one of said circulating chambers and having two branches enclosing said feed chamber therebetween and crossing said auxiliary openings; two constant stream chambers each formed near a respective one of said branches in each auxiliary opening and connected with the associated supply chambers; and a valve insert with a hollow slider associated with said outwardly adjustable flow regulating valve and arranged in at least one of said auxiliary openings.

4,537,219

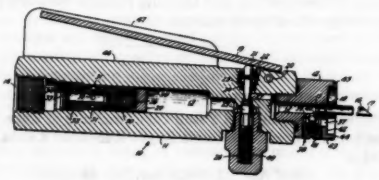
FLUID-SAMPLING VALVE FOR A HYDRAULIC SYSTEM

William P. Milish, Bristol, Conn., assignor to Transamerica DeLaval, Inc., Princeton, N.J.

Filed Oct. 7, 1983, Ser. No. 539,797

Int. Cl.³ F16K *17/168*

U.S. Cl. 137—614.19 **17 Claims**



1. A valve assembly for use in sampling fluids from high pressure hydraulic systems, said assembly comprising in combination a housing, a fluid flow passage through said housing from an inlet port to an outlet port, a nozzle coupled to said outlet port, means for selectably starting and stopping the flow of fluid through said flow passage, means for limiting the flow velocity of said flow of fluid substantially independent of input fluid pressure, and means including positive-pressure-responsive valve means for diverting fluid from said outlet port to a vent port if fluid pressure at said outlet port exceeds ambient pressure by a predetermined amount.

4,537,220

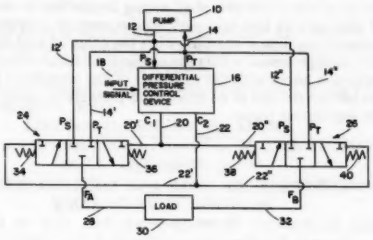
TWO MEMBER BOOST STAGE VALVE FOR A HYDRAULIC CONTROL

Wayne R. Anderson, Bloomington, Minn., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Feb. 28, 1983, Ser. No. 470,891

Int. Cl.³ E03B *3/00*

U.S. Cl. 137—625.64 **11 Claims**



1. A boost stage valve for a two stage hydraulic flow control having a pilot stage transducer converting an input signal into a first signal and a second signal capable of generating a pressure differential, a source of fluid flow under pressure and a flow return at pressure lower than the pressure of said source, said boost stage valve comprising: first and second valve members independently movable within first and second valve chambers respectively, two pairs of spring centering means with each pair independently biasing sone of said valve members to a null position in its respective bore, a first boost stage controlled output in fluid communication with said first valve chamber, a second boost stage controlled output in fluid communciation with said second valve chamber, said first and second boost stage outputs being applied across a load, means for applying said pressure differential of said first and second signals to both of said valve members so as to move said valve members against the respective biasing forces of said spring centering means, and said source and said flow return communicating with both of said chambers whereby independent movement of said first and second valve members controls fluid communication between said first and second boost stage outputs respectively from said source and to said flow return.

4,537,221

HYDRAULIC CONTROL DEVICES FOR USE WITH MINING APPARATUS

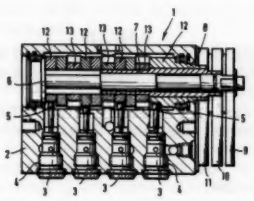
Walter Weirich, Dortmund, and Michael Dettmers, Kamen, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Apr. 24, 1984, Ser. No. 603,456

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1983, 3315313

Int. Cl.³ F16K *31/122, 31/524*

U.S. Cl. 137—637.2 **9 Claims**



1. In a hydraulic control device comprising a housing, a

plurality of individual control valves operated by tappets, manually-operable rotatable cam shaft means for displacing the tappets to operate the valves, and an automatic restoration system for acting on the cam shaft means to restore at least part of the cam shaft means back into a neutral position when manually released; the improvement comprising said restoration system includes at least a pair of hydralic piston and cylinder assemblies detachably mounted as cartridges within reception bores within the housing, one of said assemblies serving to act on a cam of the cam shaft means depending on the rotation of said cam to bias said part into its neutral position while a pressure medium is expelled from the other of said assemblies, and passage means within the housing communicating via said reception bores with the cylinders of the assemblies to permit the pistons thereof to be exposed to pressure-medium to create the restoration force.

4,537,222

HIGH-PRESSURE HOSE AND METHOD FOR THE MANUFACTURE OF SAME

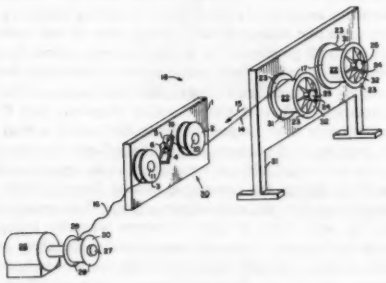
Hans G. Schwarz, Weinheim-Waid, Fed. Rep. of Germany, assignor to Polyflex Schwarz GmbH & Co., Hüttenfeld, Fed. Rep. of Germany

Continuation of Ser. No. 381,648, May 24, 1982, Pat. No. 4,444,707. This application Mar. 20, 1984, Ser. No. 591,544

Claims priority, application Fed. Rep. of Germany, May 23, 1981, 3120688

Int. Cl.³ B32B *1/08*

U.S. Cl. 138—130 **18 Claims**



1. A high-pressure hose comprising:

(a) a plastic hose core;

(b) a first layer of only pre-helically formed pressure-resisting wire members of high-tensile strength wire strands wound around the plastic hose core without a pressure-resisting fabric layer therebetween;

(c) an unbonded intermediate layer formed of plastic yarn spun from individual filaments wrapped without bonding around said first layer of pressure-resisting wire members;

(d) a second layer of only pre-helically formed pressure-resisting wire members of high-tensile strength strands directly wound around the intermediate layer; and

(e) an outer hose cover.

4,537,223

RUBBER TUBE FOR DREDGING WORK

Katsuyoshi Sumitani, Kobe, Japan, assignor to Sumitomo Gomu Kogyo Kabushiki Kaisha, Kobe, Japan

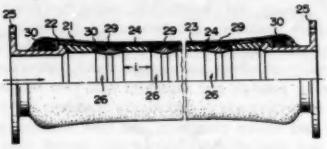
Filed Apr. 21, 1983, Ser. No. 487,125

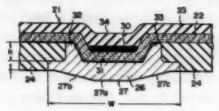
Claims priority, application Japan, Apr. 22, 1982, 57-59348[U]

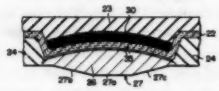
Int. Cl.³ F16L *11/08, 11/12*

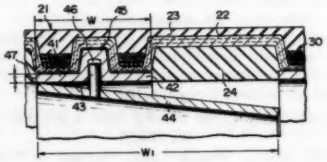
U.S. Cl. 138—139 **5 Claims**

1. A rubber tube for dredging work comprising: a tubular body made of rubber having one or more strengthening cloth layers embedded therein, and a plurality of metal rings axially arranged in a predetermined spaced relation and embedded in an inner peripheral surface of said tubular body such that the inner peripheral surface of each metal ring forms a part of the inner peripheral surface of said tubular body, each of said metal rings having an outer peripheral surface a portion of which extends substantially parallel to the longitudinal axis of said









tubular body, and an inner peripheral surface having a central surface portion extending parallel to the longitudinal axis of said tubular body, and two tapered surface portions extending longitudinally in opposite directions from opposite ends of the central surface portion and tapering radially outwardly in the oppositely extending directions.

4,537,224

RUBBER TUBE FOR DREDGING WORK

Katsuyoshi Sumitani, and Yasuo Takehara, both of Kobe, Japan, assignors to Sumitomo Gomu Kogyo Kabushiki Kaisha, Kobe, Japan

Filed Apr. 21, 1983, Ser. No. 487,126

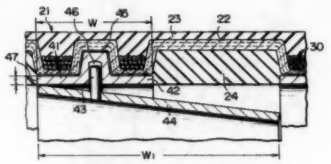
Claims priority, application Japan, Apr. 30, 1982, 57-64490[U]; May 18, 1982, 57-72856[U]; Aug. 6, 1982, 57-119789[U]

Int. Cl.³ F16L *11/08, 11/12*

U.S. Cl. 138—139 **7 Claims**

1. A rubber tube for dredging work comprising: a tubular body made of rubber having one or more strengthening cloth layers embedded therein, and a plurality of metal rings axially arranged in a predetermined spaced relation and embedded in an inner peripheral surface of said tubular body such that the inner peripheral surface of each metal ring forms a part of the inner peripheral surface of said tubular body, each of said metal

rings having an outer peripheral surface a portion of which extends substantially parallel to the longitudinal axis of said tubular body and an inner peripheral surface having a guide portion which is inclined radially inwardly in the axial direction of said tubular body in the moving direction of fluids flowing through said tubular body during use of the rubber tube in a dredging operation, each said metal ring comprising a substantially cylindrical body portion having said outer peripheral surface and a substantially truncated cone-shaped ring member disposed interiorly of said body portion and formed in its inner peripheral surface with said guide portion, and connecting means for connecting said body portion and said ring member, the connecting means comprising means defining an annular groove in said body portion and a plurality of engaging pins each having one end mounted on said ring member and the other end fitted in said annular groove.



4,537,225

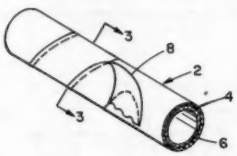
CONDUIT HAVING WATERPROOF LAYER OF UNIFORM THICKNESS AND METHOD OF MANUFACTURE

Frank E. McNulty, R.R. #1 Box 113, Siloam Springs, Ark. 72761

Continuation of Ser. No. 288,480, Nov. 16, 1981, abandoned. This application Jul. 25, 1983, Ser. No. 516,726

Int. Cl.³ F16L 9/14

U.S. Cl. 138—145 **6 Claims**



1. The method of coating a metal conduit for protection from corrosion in a below ground surface environment which comprises coating said conduit with a layer of hot applied cold flowable waterproofing material of nonuniform thickness and surrounding said layer under tension with an air permeable wrap of heat shrink resistant unwoven continuous spun bonded nylon grade polyamide having essentially no fiber ends within said wrap, said wrap being of substantially uniform thickness and permeability to permit air to expel between the waterproofing material and the wrap leaving said wrap slightly embedded in the outer surface of said material, resulting in a hot applied waterproofing material of substantially uniform average thickness on the surface of said conduit.

2. A coated conduit comprising a metal pipe coated with a layer of hot applied cold flowable water-proofing material of uniform thickness, an inner wrap sheet of unwoven continuous spun bonded heat shrink resistant individual thermoplastic filaments having essentially no fiber ends within said sheet and wrapped under tension in direct contact with said material and around said pipe, said sheet being of substantially uniform permeability whereby said sheet becomes slightly embedded in the outer surface of said coating resulting in a hot applied coating of substantially uniform average thickness on the surface of said conduit.

4,537,226

SYSTEM FOR CONTROLLING WARP LET-OFF MOTION OF WEAVING MACHINE DURING MACHINE DOWNTIME

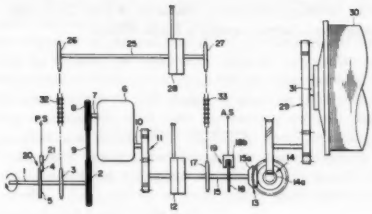
Miyuki Gotoh, Machida, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 21, 1983, Ser. No. 534,387

Claims priority, application Japan, Sep. 24, 1982, 57-166319

Int. Cl.³ D03D 49/06, 51/00

U.S. Cl. 139—100 **20 Claims**



1. A weaving system comprising

a warp beam,

a main weaving mechanism, combined with said warp beam, for moving periodically so as to repeat a weaving cycle, said main mechanism being capable of operating alternately in a normal weaving operation mode and a slow operation mode,

a driving shaft which is driven in synchronism with the periodical movement of said main mechanism,

first drive means for driving said warp beam in said normal operation mode by transmitting power from said driving shaft, said first drive means including speed change means capable of changing the speed of the warp beam rotation, said first drive means including first clutch means for connecting and disconnecting the driving connection between said driving shaft and said warp beam through said first drive means,

second drive means for driving said warp beam in said slow operation mode by transmitting power from said driving shaft, said second drive means including second clutch means for connecting and disconnecting the driving connection between said driving shaft and said warp beam through said second drive means,

first sensing means for sensing the periodical movement of said main mechanism,

second sensing means for sensing the rotational movement of said warp beam, and

control means connected with said first and second sensing means, for determining, during said normal operation mode, a quantity indicative of an angular displacement of said warp beam per weaving cycle in accordance with signals produced by said first and second sensing means, storing the determined value of said quantity, and controlling the warp beam rotation during said slow operation mode by controlling said second clutch means in such a manner that said warp beam rotates only through an angle equal to the stored value when said main mechanism is moved through one weaving cycle during said slow operation mode.

4,537,227

FABRICS WITH A CREPE EFFECT CONSTITUTED BY CONTINUOUS TEXTURIZED SYNTHETIC YARNS OF HIGH YARN/COUNT/NO. OF FILAMENTS RATIO

Vito Ballarati, Cuggiono, and Franco Tajana, Como, both of Italy, assignors to Val Lesina S.p.A., Como, Italy

Filed Apr. 19, 1982, Ser. No. 369,667
Claims priority, application Italy, Apr. 24, 1981, 21372 A/81
Int. Cl.³ D03D *15/08*; D04B *1/14*; D06C *23/04*
U.S. Cl. 139—420 R 5 Claims

1. A fabric with a crepe effect comprising continuous synthetic yarns which are texturized, substantially non-twisted, have a count between 30 and 160 Dtex, a yarn count/no. of filaments ratio between 7 and 11 Dtex, and a shrinkage in boiling water higher than 28%.

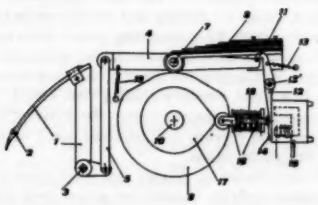
5. A method for producing fabric with a crepe effect, comprising a step in which substantially non-twisted yarns having a count between 30 and 160 Dtex and a yarn count/no. of filaments ratio between 7 and 11 Dtex are texturized, then are passed through a setting oven at such a temperature as to obtain shrinkage in boiling water of at least 28%, and are used to produce a fabric having a crepe effect.

4,537,228

WEFT PRESENTING DEVICE FOR WEAVING LOOMS

Ettore Viscardi, Nembro, Italy, assignor to Somet Societa' Meccanica Tessile S.p.A., Bergamo, Italy

Filed Jul. 6, 1983, Ser. No. 511,260
Claims priority, application Italy, Jul. 19, 1982, 22441/82[U]
Int. Cl.³ D03D *47/38*
U.S. Cl. 139—453 3 Claims



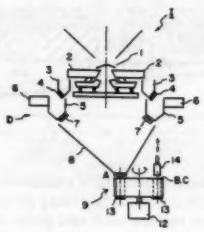
1. Weft presenting device for a weaving loom with continuous weft feed, comprising a presenting needle oscillatable between an inoperative and operative position, a pivotal rocking lever, a connecting rod pivotally attaching said needle and one end of said rocking lever, a spring on said end of said rocking lever to bias said rocking lever toward an inoperative position corresponding to the inoperative position of said needle, a pivotal control lever having a hook on one end to engage the other end of said rocking lever, a first rotatable cam having a cam surface, a control rod having one end in contact with the surface of said first cam, the other end of said control rod contactible with the other end of said pivotal control lever to push said control lever into an engageable position with said rocking lever under the action of said first cam, a spring connected to said control lever to bias it in an unengageable direction and electromagnetic means to be energized to hold said control lever in an engageable position with the other end of said rocking lever.

4,537,229

AUTOMATIC WEIGHING APPARATUS AND METHOD

Takashi Sashiki, Nagaokakyo, and Keiko Sakaeda, Kyoto, both of Japan, assignors to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Sep. 15, 1983, Ser. No. 532,519
Claims priority, application Japan, Sep. 16, 1982, 57-161995; Sep. 16, 1982, 57-161996
Int. Cl.³ G01G *19/04*; B65B *1/32*
U.S. Cl. 141—83 9 Claims



1. An automatic weighing apparatus comprising;

weighing means for weighing out articles having variable specific gravity, to obtain a batch thereof having a weight corresponding to a target weight value and which is within preset allowable limits of the target weight value;

shaping means for shaping said batch of articles into a fixed volume;

pressure sensing means for sensing the pressure which develops when the weighed out articles are shaped into the fixed-volume batch, and for providing a corresponding output; and

target weight value adjusting means responsive to said output from said pressure sensing means for adjusting means for adjusting said target weight value within the preset allowable limits, for subsequent operation of said weighing means, so as to render the volume of batches of weighed out articles substantially constant.

4,537,230

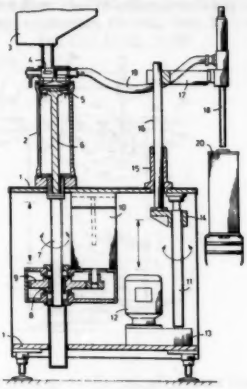
APPARATUS FOR MOVING DISPENSING PISTONS AND FILLING TUBES

Hugo Schindel, Saulheim, Fed. Rep. of Germany, assignor to Rationator-Maschinenbau GmbH, Hillesheim, Fed. Rep. of Germany

Filed Aug. 2, 1983, Ser. No. 519,676
Claims priority, application Fed. Rep. of Germany, Aug. 3, 1982, 3228935
Int. Cl.³ B65B *3/12*; B67D *5/46*
U.S. Cl. 141—146 4 Claims

1. Apparatus for moving a dispensing piston and a filling tube during the filling of shaped containers with a fluid, comprising at least one dispensing piston and at least one filling tube spaced therefrom, separate first and second screw-threaded spindles and nuts mated thereto respectively to move the piston to dispense filling fluid to the filling tube and to position the filling tube relative to the container to be filled

thereby, each spindle having a driven element for rotating the spindle, and respective drive means for each spindle including



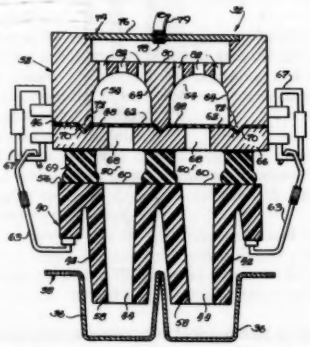
an infinitely variable electric motor gear-coupled to the related driven element.

4,537,231

DISPENSER APPARATUS FOR SIMULTANEOUSLY DISPENSING PREDETERMINED EQUAL VOLUMES OF LIQUID INCLUDING A DISPOSABLE DISPENSER MODULE

Paul R. Hasskamp, Cockeysville, Md., assignor to Becton, Dickinson and Company, Paramus, N.J.

Filed Aug. 29, 1983, Ser. No. 527,294
Int. Cl.³ B65B *3/30*
U.S. Cl. 141—238 **1 Claim**



1. Dispenser apparatus for simultaneously providing predetermined equal volumes of liquid to each of a plurality of wells, said apparatus comprising:

a disposable multiple chamber dispenser module of integral plastic construction having a top surface and a plurality of dependent walls each defining a lower chamber for alignment with a corresponding well, each chamber having an open lower nozzle end and extending upwardly to an opening in said top surface;

a die plate having a plurality of concavities each having an equal volume and a mouth, and each being defined by an inner surface and corresponding to one of said chambers;

a diaphragm having a portion extending across the mouth of each concavity, each said portion being movable from said mouth into substantially full surface contact with said inner surface,

means for spacing said diaphragm from said top surface and forming an upper chamber which constitutes an upper extension of each lower chamber, said upper chamber having a volume that is variable by the position of said diaphragm portion; and

means for moving each diaphragm portion between a first position across the mouth of its concavity and a second position wherein it is in surface contact with said inner surface, whereby the volume of each upper chamber can be changed by the same amount by selective operaton of said means for moving, said diaphragm being disposed between said die plate and said dispenser module and wherein said means for moving comprises means for providing a vacuum,

said means for providing a vacuum including a vacuum manifold on said die plate, each inner surface having a plurality of vacuum openings,

said means for spacing comprising a clamping plate disposed between said diaphragm and said dispenser, said clamping plate having a bottom surface,

said dispenser apparatus further comprising means for sealing for forming air tight seals with the top surface of said dispenser module including a gasket sheet bonded to said bottom surface of said clamping plate to enter into a sealing relationship with said top surface of said dispenser module, said gasket sheet having an aperture in alignment with each upper chamber and its corresponding lower chamber so that the upper chambers are isolated from one another, the material of said gasket sheet not overlying any of said lower chambers,

said dispenser module further including a dependent peripheral skirt terminating in a lower abutment surface for engagement by a clamp, said clamping plate also comprising an abutment surface for engagement by said clamp,

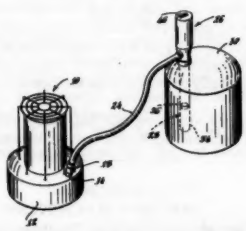
said clamping plate having a first surface facing said diaphragm and said die plate has a second surface facing said diaphragm, one of said first and second surfaces having grooves and the other of said first and second surfaces having corresponding projections, the projections pushing components of said diaphragm into said grooves.

4,537,232

FLUID DISCRIMINATING APPARATUS

Michael F. Barber, 177 Richmond Hill, New Canaan, Conn. 06840

Continuation-in-part of Ser. No. 481,793, Apr. 4, 1983,. This application Apr. 4, 1984, Ser. No. 596,544
Int. Cl.³ G01N *9/00*
U.S. Cl. 141—382 **14 Claims**



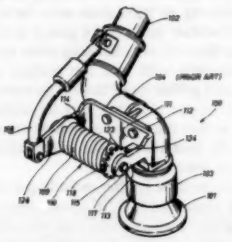
1. An apparatus for fueling kerosene heaters with improved safety, which comprises:

(a) a fuel reservoir, adapted for integral use with a kerosene heater, which includes a port for filling said reservoir with kerosene;

(b) lock means integral with said port for limiting access therethrough to a mating connector;

(c) said mating connector configured to mate with said lock means and provide access through said port;
(d) conduit means operatively engaged with said mating connector for transporting kerosene to said reservoir from a supply of kerosene;
(e) means operatively engaged with said conduit means for withdrawing kerosene from a storage vessel and advancing it through said conduit means; and
(f) fluid discriminator means, operatively engaged with said withdrawing and advancing means, for sensing the presence of fluids other than kerosene suitable for heater use and terminating flow in response to the sensed presence of such other fluids.

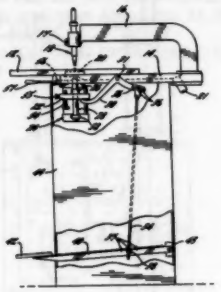
4,537,233
SPRING BALANCE ASSEMBLY
Evart. J. Vroonland, and William M. Curtis, both of Richardson, Tex., assignors to Continental Emsco Company, Garland, Tex.
Filed Jun. 21, 1983, Ser. No. 506,276
Int. Cl.³ B65B *3/04*
U.S. Cl. 141—387 **9 Claims**



1. A loading arm comprising:
(a) a support means;
(b) an arm pivotally attached to said support means for swivel movement in the horizontal and vertical plane relative to said support means;
(c) a means for balancing said swivel arm relative to said support means including:
(1) a coil spring of pre-determined length;
(2) a housing enclosing said coil spring;
(3) a first end of said housing having a means for engaging a first coil end of said coil spring and a means for positioning said first coil end in infinitely small increments along a generally circular path radially disposed from the center line of said spring;
(4) a second end of said housing having a means for engaging a second coil end of said spring;
(5) a linkage arm attached at one end to said swivel arm and at its other end to said second end such that movement of said swivel arm in said vertical plane will cause said second coil end to move along a generally circular path radially disposed from the centerline of said spring; and
(d) a means for attaching said balancing means to said loading arm and said horizontal swivel means.

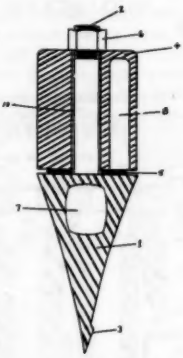
4,537,234
ROUTING MACHINES
Charles R. Onsrud, P.O. Box 416, Troutman, N.C. 28166
Filed Sep. 7, 1982, Ser. No. 415,012
Int. Cl.³ B27C *5/00*
U.S. Cl. 144—134 A **6 Claims**

1. In an inverted pin routing machine, a router spindle slide having a first vertically aligned shaft attached to a machine base and adapted to receive a close fitting bushing, said bushing being the primary bearing surface for guiding a router spindle carried by a router mount in the vertical direction; a second vertically aligned shaft spaced apart from said first shaft attached to said machine base and fine adjustment screws attached to said router mount, said screws engaging said second shaft to prevent rotation of said router mount about said



first shaft; said screws further allowing axial alignment of the router spindle and being adjustable to compensate for wear and to control the relative freedom of the vertical sliding of the router spindle with respect to the shafts.

4,537,235
WOOD SPLITTER
Stephen E. Aderneck, Box 188, Quathiaski Cove BC, Canada V0P 1N0, assignor to Stephen Aderneck
Filed Feb. 21, 1984, Ser. No. 581,555
Int. Cl.³ B27L *7/00*
U.S. Cl. 144—193 C **1 Claim**

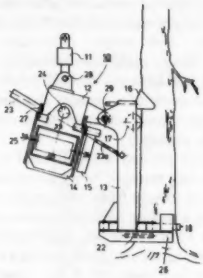


1. A wood splitting tool comprising a wedge-shaped metal piece having a thickened end portion and an opposite, elongated, wood penetrating blade portion having opposite sides; said tool further comprising a ridge along one side of said blade portion, a handle tool located in said end portion for securing a handle therein, a shaft attached to and extending outwardly from said end portion opposite said blade portion and having threads at its free end, a driving piece having a central hole therethrough for slideably engaging said threaded shaft, and a nut threadably attached to said shaft for securing said driving piece to said shaft; said driving piece being of greater mass than said wedge-shaped piece and having a means defining a hollow cavity and a means defining a lip for preventing rotation of said driving piece with respect to said wedge-shaped piece; said tool also having a rubber washer located between said wedge-shaped piece and said driving piece.

4,537,236
GRAB HARVESTER

Sakari Kulju, Pello, Finland, assignor to Valmet Oy, Finland

Filed Dec. 16, 1983, Ser. No. 561,992
Claims priority, application Finland, Dec. 21, 1982, 824397
Int. Cl.[3] A01G *23/08*
U.S. Cl. 144—336 8 Claims



1. In a grab-type tree harvester for processing trees, including

a frame;

rotation means mounted to said frame and adapted to be connected to lifting means, for rotating said frame about a substantially vertical axis;

grab means mounted on said frame for operatively engaging a tree to be processed, said grab means being selectively movable between open and closed positions;

actuating means for selectively opening and closing said grab means;

roller means for operatively engaging and pulling a felled tree being processed through said grab means; and

pruning means for operatively engaging and removing branches from the felled tree being processed as it moves through said grab means;

the improvement comprising:

a jib pivotally mounted to said frame and adapted to be turned with respect to said frame, said pruning means, and said grab means to a position substantially parallel to a standing tree to be felled;

means for turning said jib with respect to said frame, said pruning means, and said grab means to said position substantially parallel to the standing tree to be felled;

means mounted on said jib for gripping the standing tree to be felled; and

saw means mounted on said jib for cross-cutting the standing tree to fell the same.

5. Method for harvesting a standing tree, comprising the steps of

disposing a jib substantially parallel to a trunk of the standing tree, the jib being pivotally mounted to a frame on which grab means and pruning means are mounted,

actuating gripping means mounted on said jib to grip the standing tree and to press the same against saw means,

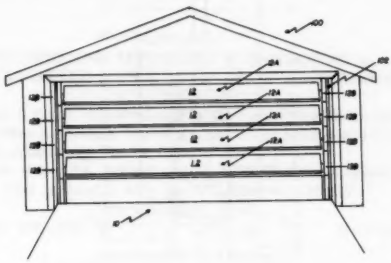
actuating said saw means mounted on said jib and pressing against the tree trunk, to cross-cut the standing tree, and

guiding the cross-cut tree to fall in a directed manner by turning only said jib with respect to said frame, said pruning means, and said grab means, to a felled position where said grab means and pruning means operatively engage the same.

4,537,237
LOUVERING OVERHEAD SECTIONAL DOOR

Frank J. Sepulveda, and Robert R. Silva, both of San Jose, Calif., assignors to Robert E. Reid, San Jose, Calif., a part interest

Continuation of Ser. No. 283,089, Jul. 13, 1981,. This application Dec. 12, 1983, Ser. No. 561,123
Int. Cl.[3] E05D *15/06*
U.S. Cl. 160—201 8 Claims



1. A louvering overhead sectional door assembly such as that utilized to close a vertical opening in a structure, the assembly including a door comprising a plurality of substantially planar, articulatably interconnected members and having means attached thereto for engaging a guide means mounted in correspondence to the opening such that the door may traverse the guide means to open and close the opening, said assembly characterized by

(a) each of a plurality of adjacent substantially planar members comprising a center louvering section pivotally attached to a pair of non-louvering end sections;

(b) louvering means attached to each of the center louvering sections for pivoting the center louvering sections when the door is vertically disposed, the louvering means comprising a pair of hinge assemblies, each hinge assembly comprising interconnected hinges, one such hinge being attached to a corresponding center louvering section;

(c) a plurality of releasable section locks, at least one such lock being attached to each center louvering section for locking the center louvering section into the plane of its corresponding planar member; and

(d) section lock release means operatively connected to the section locks for simultaneously releasing the section locks such that each of the center louvering sections may pivot out of the plane of its corresponding planar member.

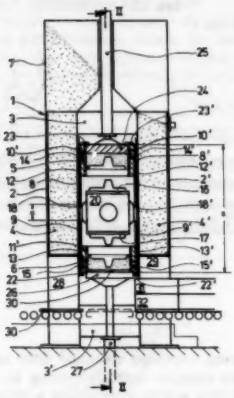
4,537,238
MOLDING MACHINE FOR MAKING FLASKLESS MOLDS

Michael Achinger, Neuburger Strasse 40, 8900 Augsburg, Fed. Rep. of Germany; Erhard Jaeger, Mettmann; Reinhold Lipp, Holzheim, and Walter Streitenberger, Freidberg-Derching, all of Fed. Rep. of Germany, assignors to Michael Achinger, Augsburg, Fed. Rep. of Germany

Filed Feb. 22, 1983, Ser. No. 468,624
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1982, 3206169
Int. Cl.[3] B22C *15/00*
U.S. Cl. 164—169 12 Claims

1. A molding machine for pressure shaping flaskless molds comprising a rectangular support frame including a pair of oppositely disposed side parts, two oppositely disposed molding flasks which are movable back and forth vertically and enclosed within said pair of side parts, a match plate carrier that can be moved in a horizontal direction into and from a position between said molding flasks, said match plate carrier including oppositely disposed match plates thereon, said rectangular support frame in which said molding flasks are en-

closed absorbs any reactive forces arising during a pressure-shaping process, said side parts are hollow for receiving a pourable molding material, said rectangular frame being symmetrical in a central plane that is normal to a vertical central plane of the rectangular frame, said side parts containing oppositely disposed openings and each of said molding flasks having



oppositely disposed openings in their sides which are in alignment with said openings in said side parts when said molding flasks are in a mold forming position relative to said match plates so that molding material can be transferred from said side parts to said molding flasks via said openings, and guide plates on said side parts for guiding said molding flasks for movement relative to said side parts.

4,537,239

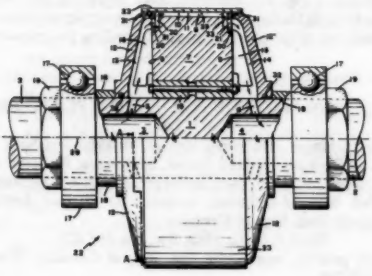
TWO PIECE CASTING WHEEL

Boleslaw L. Budzyn, Passaic, and Charles E. Carlson, Succasunna, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Continuation of Ser. No. 397,755, Jul. 13, 1982, abandoned. This application Aug. 20, 1984, Ser. No. 641,939

Int. Cl.³ B22D *11/06*

U.S. Cl. 164—423 **20 Claims**



17. A chilled casting wheel for providing a quench rate of at least about 10^4° C./sec, comprising:

(a) a hub shaft member having a concentric axis of rotation and two axial end portions, each end portion delimiting an axial coolant chamber having at least one coolant supply passage communicating radially therefrom;

(b) an annular wheel core member concentrically connected to said hub shaft and adapted to rotate therewith, said wheel core having axially extending channels formed about an outer peripheral surface thereof, two axially facing side portions, and an annular, radially extending channel in each of said side portions for conducting coolant to and from said axial channels;

(c) a separate, cylindrical, axially extending wheel rim member, which is concentrically connected to said peripheral core surface, has a preselected interference fit therewith to provide a residual, circumferential tensile stress within said rim, and which has a thickness, measured radially, ranging from about 0.060–0.25 in (0.15–0.64 cm), wherein said residual stress counteracts crowning stresses induced by a radial temperature gradient between an outer quench surface and an interior surface of said rim to hold said rim substantially flat across the width of said wheel core member;

(d) two annular flange members connected concentric with said hub shaft and adjacent to each of said core side portions to delimit an annular coolant chamber at each side of said wheel core which communicates with its respective coolant supply passage;

(e) a ring member located at each axial edge of said rim member, each ring member being connected to said wheel core and spaced axially from said axially extending channels, providing a sealing surface against which to connect the respective flange member, and having a plurality of openings extending axially therethrough into said annular channels in the face portions of the wheel core; and

(f) a plurality of coolant vanes disposed within said annular coolant chambers to direct coolant radially therethrough, said vanes aligned radially and positioned to face circumferentially.

4,537,240

APPARATUS FOR CONTINUOUS CASTING

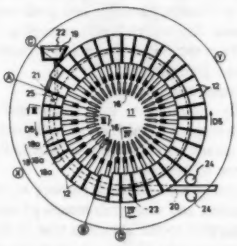
Yutaka Tsuchida, Yokosuka, and Toshiyuki Fukai, Yokohama, both of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 9, 1983, Ser. No. 502,722

Claims priority, application Japan, Jun. 23, 1982, 57-107837

Int. Cl.³ B22D *11/06*

U.S. Cl. 164—430 **5 Claims**



1. A machine for continuously casting at high speed a thin strip of metal from a molten metal bath comprising:

(a) a rotary casting wheel provided with a casting ring on the outer periphery thereof;

(b) a plurality of contiguous molds pivotally carried by said casting wheel, each of said molds being moveable between open and closed positions and cooperating with said casting ring to define, upon closing, a continuous cavity along part of the outer periphery of said wheel to form said cast metal strip, each said mold being L-shaped in cross section at the point of contact with said casting ring;

(c) means for pivoting said molds to open and close said molds in sequence during rotation of said wheel, thereby permitting molten metal to be poured into closed molds, to solidify in said closed molds, and to be removed from open molds in the form of a casting, said means for pivoting said molds including a power cylinder pivotally af-

fixed to said wheel and an arm connected to each said mold;

(d) means for pouring molten metal into said closed molds; and

(e) means for removing the resulting casting from said open molds in the form of a continuous thin strip of metal.

4,537,241

METAL SUPPORTING STRUCTURE FOR CONTINUOUS CASTING MACHINES

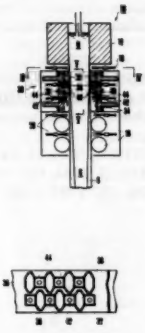
Toshio Kanamori, Niihama, Japan, assignor to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

Filed Feb. 22, 1983, Ser. No. 468,723

Claims priority, application Japan, Feb. 25, 1982, 57-024928[U]; Mar. 30, 1982, 57-044013[U]

Int. Cl.³ B22D *11/12, 11/124*

U.S. Cl. 164—442 **19 Claims**



17. A continuous casting machine comprising a downwardly opening mold for casting a continuous metal strand, a structure for supporting and cooling the cast metal strand after it is discharged from said continuous casting mold, comprising: a backing frame having interior wall means defining a downwardly extending cavity extending away from said mold, said backing frame having exterior wall means remote from said cavity and a multiplicity of spaced-apart through openings extending through said backing frame from said exterior wall means to said interior wall means; a multiplicity of spray nozzles arranged adjacent to said exterior wall means of said backing frame and arranged to spray cooling water through said openings onto the cast metal strand that is moving through said cavity; a wear lining on the interior wall means of said backing frame, said wear lining comprising a multiplicity of metal-supporting elements protruding inwardly into said cavity from said interior wall means of said backing frame, said metal supporting elements having inner end faces adapted to contact and support the cast metal strand and defining a guide passage that conforms to the shape of the cast metal strand, said metal supporting elements being spaced apart from each other and being spaced from said openings so as not to obstruct spraying of said cooling water through said openings into said guide passage, said metal supporting elements being arrayed in horizontally and vertically spaced-apart, staggered relationship to each other, said metal supporting elements being of a generally octagonal shape and having upper edge portions which taper in an upward direction and having lower edge portions which taper in a downward direction so as to permit water easily to flow downwardly in said guide passage and to permit water vapor generated by contact of water with said cast metal strand to escape upwardly in said guide passage, the upper and lower edge portions of adjacent vertically spaced-apart metal supporting elements being in vertically overlapping relationship to that vertically continuous support for the cast metal strand is provided by said metal supporting elements;

a plurality of guide rollers disposed below said structure for guiding the cast metal strand after it leaves said structure;

a plurality of upper spray nozzles between said structure and said mold for spraying water onto the cast metal strand in order to cool said strand; and

a plurality of lower spray nozzles associated with said guide rollers for spraying water onto the cast metal strand in order to cool said strand.

4,537,242

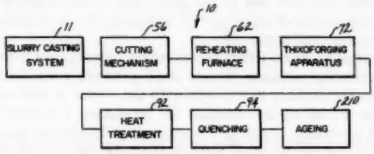
METHOD AND APPARATUS FOR FORMING A THIXOFORGED COPPER BASE ALLOY CARTRIDGE CASING

Michael J. Pryor, Woodbridge; Joseph Winter, New Haven, and Jonathan A. Dantzig, Hamden, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Division of Ser. No. 337,560, Jan. 6, 1982, Pat. No. 4,494,461. This application May 31, 1984, Ser. No. 616,023

Int. Cl.³ B22D *27/00*

U.S. Cl. 164—460 **19 Claims**



1. A process for forming a cartridge casing having a thin-walled, high strength, elongated member, said process comprising:

forming a semi-solid slurry from an age hardenable copper base alloy;

forging said semi-solid slurry to form said member; and age hardening said forged member.

4,537,243

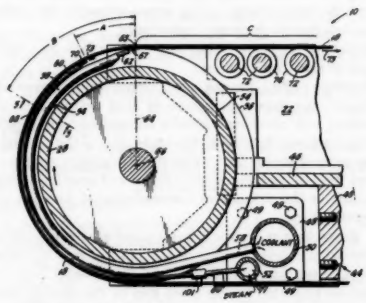
METHOD OF AND APPARATUS FOR STEAM PREHEATING ENDLESS FLEXIBLE CASTING BELT

Robert W. Hazelett, Winooski, and John F. B. Wood, Burlington, both of Vt., assignors to Hazelett Strip-Casting Corporation, Malletts Bay, Vt.

Continuation of Ser. No. 199,619, Oct. 22, 1980, abandoned. This application Nov. 9, 1983, Ser. No. 550,253

Int. Cl.³ B22D *27/02*

U.S. Cl. 164—481 **29 Claims**



1. In the continuous casting of molten metal wherein the molten metal is contained and moved along in a casting zone

having an input end and an output end by at least one thin, flexible endless casting belt, said output end of said casting zone being downstream from said input end of said casting zone, said casting belt having a front surface carrying said molten metal in said casting zone and having a reverse surface and wherein the casting belt travels partially around curved guide means adjacent to the input end of the casting zone with the reverse surface of the belt being curved concave where the belt travels around said guide means, the improved method of preheating the casting belt before it reaches the input end of the casting zone comprising the steps of:

providing said guide means with deep circumferential grooves adjacent to said curved reverse surface of the casting belt,

conducting steam along confining passages within said deep grooves,

impinging first jets of steam directed radially outwardly from said confining passages in said deep grooves against the reverse surface of the belt for producing a first stage of elevation of the belt temperature before the belt reaches said input end of said casting zone,

said first jets of steam being located upstream of the input end of the casting zone by an angular distance of at least 45° defined by the arc of a 45 degree angle as measured from said first jets to the input end of said casting zone with an axis of curvature of said guide means defining the apex of said angle,

impinging second jets of steam aimed downstream from said confining passages in said deep grooves contacting the reverse surface of the belt with the steam in said second jets travelling downstream for producing a second stage of elevation of the belt temperature following said first stage of elevation of the belt temperature in front of the position where the belt reaches said input end of said casting zone and for creating a downstream flow of steam in said deep grooves travelling downstream toward the input end of said casting zone,

said second jets of steam being angularly spaced downstream by a second angular distance of at least 20° from said first jets,

conducting coolant liquid along other confining passages within said deep grooves, and

impinging jets of liquid coolant aimed downstream from said deep grooves striking the reverse surface of the belt at an angle of incidence less than 25° near to the input end of the casting zone and travelling downstream along the reverse surface of the belt as the belt enters the casting zone.

15. In a machine for continuously casting molten metal wherein at least one thin, endless, flexible casting belt having a front face and a reverse face revolves around pulleys and passes along a casting zone having an input end and an output end, said output end of the casting zone being downstream from said input end, said belt moving along said casting zone from the input end to the output end of the casting zone for carrying the metal being cast against the front face of the casting belt through said casting zone, apparatus for preheating said casting belt with steam comprising:

an input pulley for moving said casting belt into the input end of said casting zone,

said input pulley having circumferential grooves therein underlying the reverse face of said casting belt as said casting belt revolves partially around said input pulley in moving toward and into the input end of the casting zone,

wrap-around steam feed tubes each having a nozzle on the end thereof, said steam feed tubes and nozzles being positioned in the respective circumferential grooves of said input pulley,

said steam feed tubes each having radial steam ports aimed toward the reverse face of the casting belt for applying steam from said radial ports to the reverse face of said endless belt near to the input end of the casting zone for preheating said belt before said belt enters the input end of said casting zone,

said radial steam ports being located upstream of the input end of the casting zone by a first angular distance of at least 45° defined by an angular arc as measured from said first jets to the input end of said casting zone with an axis of rotation of said input pulley defining the apex of said angle,

said nozzles being located downstream from said radial ports by a second angular distance of at least 20° from said radial ports, said second angular distance being defined by an angular arc as measured from said radial ports with said axis of rotation defining the apex thereof, and

said nozzles being aimed downstream for applying steam travelling downstream from said nozzles impinging against the reverse face of the belt nearer to the input end of the casting region than said radial ports for producing a second stage of preheating said belt before the belt reaches said input end of the casting zone,

said two stages of steam preheating reducing belt distortion caused by the tremendous heating effect of the molten metal for thereby enabling the speed of the casting machine to be increased.

4,537,244

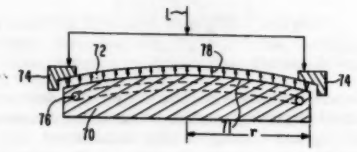
METHOD FOR OPTIMUM CONDUCTIVE HEAT TRANSFER WITH A THIN FLEXIBLE WORKPIECE

Scott C. Holden, Manchester, Mass., assignor to Varian Associates, Inc., Palo Alto, Calif.

Division of Ser. No. 381,668, May 25, 1982, abandoned. This application Mar. 2, 1984, Ser. No. 585,743

Int. Cl.³ F28F 9/00

U.S. Cl. 165—1 **7 Claims**



1. A method for optimizing transfer of thermal energy with a thin, flexible workpiece in vacuum comprising:

establishing the geometry and material of the thin, flexible workpiece; and

selecting a contour of a nonplanar, nonspherical contact surface, based on the geometry and material of said workpiece, for transfer of thermal energy to or from said workpiece when said workpiece is clamped thereto at its periphery, said contour being selected to impose uniformity of contact pressure over the surface area of said workpiece and to simultaneously stress said workpiece to approach the limiting elastic stress thereof.

4,537,245

ZONE AIR-CONDITIONING CONTROL SYSTEM FOR MOTOR VEHICLE COMPARTMENT

Masao Nishimura, Anjo; Masami Mori, and Akirou Yoshimi, both of Oobu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Sep. 30, 1982, Ser. No. 428,613

Claims priority, application Japan, Oct. 9, 1981, 56-161475

Int. Cl.³ F24F 3/044, 7/06

U.S. Cl. 165—22 **6 Claims**

1. A zone air-conditioning control system for use with a motor vehicle, comprising:

(a) an air-conditioning unit having:

a single duct for leading incoming air thereinto,

a refrigerating unit disposed in said single duct for cooling air led into said single duct,

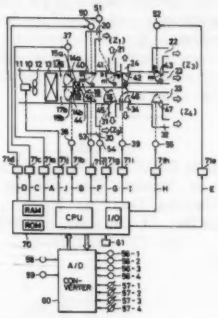
first and second ducts respectively communicating with

said single duct at a downstream portion of said single duct, and

first and second temperature adjustment mechanisms respectively disposed in said first and second ducts, each of said first and second temperature adjustment mechanisms including a heat exchanger, for heating air passing therethrough, and being provided for controlling the amount of heat exchanged;

(b) first to fourth branch ducts for distributing temperature-controlled air to first to fourth air-conditioning zones established in the passenger compartment of said motor vehicle, said air-conditioning zones being respectively defined by the front right seat area, the front left seat area, the rear right seat area, and the rear left seat area of the passenger compartment, said first and third branch ducts being communicated to said first duct and being related to said first temperature adjustment mechanism, and said second and fourth branch ducts being communicated to said second duct and being related to said second temperature adjustment mechanism, said first branch duct communicating with said first air-conditioning zone, said second branch duct communicating with said second air-conditioning zone, said third branch duct communicating with said third air-conditioning zone, and said fourth branch duct communicating with said fourth air-conditioning zone;

(c) first and second flow rate changing means for changing



the flow rate of air flowing through said branch ducts, said first flow rate changing means being disposed in said first duct, and said second flow rate changing means being disposed in said second duct;

(d) temperature detecting means for generating electrical signals each indicative of the temperature of air in each of said air-conditioning zones;

(e) temperature setting adjusters with which a desired temperature in each of said first to fourth air-conditioning zones can be set;

(f) a control unit for controlling said first and second temperature adjustment mechanisms and said first and second flow rate changing means in accordance with electrical signals from said temperature detecting means and electrical signals from said temperature setting adjusters so as to cause temperature detected in each of said first to fourth air-conditioning zones to approach temperature set by means of said temperature setting adjusters, said control unit controlling said first temperature adjustment mechanism in accordance with each difference between said set temperature and said detected temperature in said first and third air-conditioning zones and controlling said second temperature adjustment mechanism in accordance with each difference between said set temperature and said detected temperature in said second and fourth air-conditioning zones, said control unit controlling said first flow rate changing means to proportion a first distribution amount of temperature-controlled air to be supplied between said first air-conditioning zone and said third air-conditioning zone and controlling said second flow rate changing means to proportion a second distribution amount of temperature-controlled air to be supplied between said second air-conditioning zone and said fourth air-conditioning zone; and

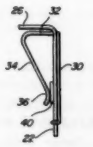
(g) actuating means for actuating said first and second temperature adjustment mechanisms and said first and second flow rate changing means in accordance with commands from said control unit.

4,537,246

VERTICAL HEAT SINK

Robert H. F. Lloyd, Woodside, Calif., assignor to Conver Corporation, Woodside, Calif.

Filed Dec. 9, 1983, Ser. No. 559,782
Int. Cl.³ H01L *23/40*
U.S. Cl. 165—80 B **10 Claims**



1. A heat sink for dissipating heat generated by an electronic component mounted thereon, comprising:

a vertical heat conductive member having upper and lower edges and first and second surfaces, said lower edge having connecting tabs at opposite ends thereof, said upper edges having two mounting tabs at opposite ends thereof, said mounting tabs having apertures passing therethrough; and

resilient clip means removably coupled to said vertical heat conductive member for holding said electronic component to said vertical heat conductive member, said resilient clip means including first and second legs resiliently biased toward each other so that said first leg holds said electronic component against said vertical heat conductive member when said electronic component and said vertical heat conductive member are placed between said first and second legs, said second leg having a terminating lip which engages said lower edge of said vertical heat conductive member.

4,537,247

HEAT PIPE HEAT EXCHANGER

Eiji Okamoto; Yasuhiro Fukaya, both of Kobe, and Michio Chikami, Ibaraki, all of Japan, assignors to Gadelius Kabushiki Kaisha, Japan

PCT No. PCT/JP82/00283, § 371 Date Mar. 21, 1983, § 102(e) Date Mar. 21, 1983, PCT Pub. No. WO83/00380, PCT Pub. Date Feb. 3, 1983
PCT Filed Jul. 21, 1982, Ser. No. 480,949
Claims priority, application Japan, Jul. 22, 1981, 56-113527
Int. Cl.³ F28D *15/00*
U.S. Cl. 165—104.14 **5 Claims**

1. A heat pipe heat exchanger comprising:

a low temperature fluid passage and a high temperature fluid passage defined by a partition board;

a plurality of heat pipes extending over the entire width of said passages, said heat pipes being bare at least at the high temperature fluid passage side;

finless outer pipes coated at the outer surface with enamel for corrosion protection, said heat pipes at the high tem-

perature fluid passage side being removably inserted into said finless outer pipes; and

a heat conductive material disposed between said heat pipes and said finless outer pipes.

4,537,248

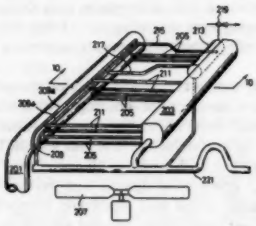
AIR-COOLED HEAT EXCHANGER

Kunihiko Minami, Sakai, Japan, assignor to Sasakura Engineering Co., Ltd., Osaka, Japan

Division of Ser. No. 214,086, Dec. 8, 1980, Pat. No. 4,417,619. This application May 25, 1983, Ser. No. 497,863

Int. Cl.³ F28B *1/06, 9/10*

U.S. Cl. 165—113 **2 Claims**



1. An air-cooled heat exchanger comprising at least one set of first tubes and second tubes extending generally in parallel to each other through which fluid being cooled flows in the same direction and across which air flows to cool the fluid within said tubes, said first tubes having a first longitudinal portion and a second longitudinal portion downstream of said first portion with respect to the air flow, and said second tubes having a first longitudinal portion adjacent to and downstream with respect to the air flow from said first portion of said first tubes and a second longitudinal portion adjacent to said second portion of said first tubes and upstream with repect to the air flow of said first portion of said second tubes and also upstream of said second portion of said first tubes, said first and second portions of said tubes being connected by an intermediate bend, first header means and second header means extending substantially in parallel to each other and at an angle to a horizontal plane, said first and second longitudinal portions of each tube extending horizontally between said header means, said tubes being devoid of rising portions in the direction of the fluid flow therethrough, said intermediate bend of one of said first and second tubes being directed substantially horizontally and said bend of the other tubes being directed substantially in a generally vertical plane adjacent said other tubes.

4,537,249

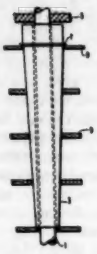
HEAT FLUX LIMITING SLEEVES

William G. Harris, Tampa, Fla., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 2, 1981, Ser. No. 230,554

Int. Cl.³ F28F *13/14*

U.S. Cl. 165—134 R **7 Claims**



1. A heat flux limiting tubular sleeve for a single heat exchanger tube having a generally uniform outside diameter, said tubular sleeve extending over only a portion of said tube, being open on both ends, having one end of the tubular sleeve larger in diameter than the other end thereof and having a wall thickness which decreases in the same direction as the diameter of the sleeve decreases, whereby the heat transferred through the tubular sleeve and tube is less on the larger diameter end of the sleeve than on the other end thereof.

4,537,250

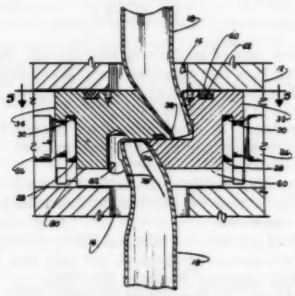
SHEARING TYPE BLOWOUT PREVENTER

John N. Troxell, Jr., Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.

Filed Dec. 14, 1983, Ser. No. 560,941

Int. Cl.³ E21B *29/08*

U.S. Cl. 166—55 **3 Claims**



1. A ram-type shearing apparatus for a wellhead comprising

a body having a bore therethrough and ram guideways extending laterally from opposite sides of the bore,

a ram assembly located in each of the ram guideways, each ram assembly comprising a ram body and means for reciprocating the ram bodies into and from the bore,

each ram body having a cutting blade in position for the cutting edge of the blade on one ram body to pass just below the cutting edge of the blade on the other to shear a string positioned in the bore when the ram assemblies are moved together in the bore,

sealing means on each of said ram bodies including a sealing strip positioned in a groove extending transversely across

the lower surface of the upper of said cutting blades to seal against the upper surface of the lower of said cutting blades,

the lower cutting blade includes a pair of nodes on its face extending toward the upper cutting blade with an arcuate recess therebetween to engage the string initially during shearing and to penetrate said string prior to other shearing of the string whereby the forces of shearing said string are reduced,

the shape of said ram bodies and their cutting blades constraining the upper end of the lower sheared portion of the string so that it is partially open after the lower cutting blade is in sealing engagement with said upper cutting blade sealing strip to allow flow therein to be engaged by an overshot type of retrieving tool.

4,537,251

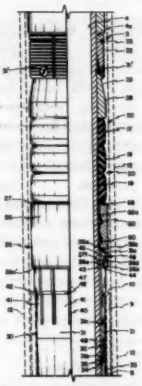
ARRANGEMENT TO PREVENT PREMATURE EXPANSION OF EXPANDABLE SEAL MEANS

Britt O. Braddick, P.O. Box 35729, Houston, Tex. 77235

Filed Apr. 6, 1984, Ser. No. 597,697

Int. Cl.³ E21B *23/06*

U.S. Cl. 166—196 **10 Claims**



1. In a seal nipple packer having a tubular member with seals thereon for sealing above the annular end of a tubular receptacle supported in a well string, the invention including:

expandable seal means on the tubular member for sealing with the well string above the annular end of the receptacle;

actuating means including a setting sleeve movable on the tubular member for expanding said expandable seal means into engagement with the well string; and

releasable retaining means having a radially flexible portion engaged with said actuating means and the tubular member to retain said actuating means in a nonactivated position until said radially flexible portion of said releasable retaining means engages substantially the full annular end of the tubular receptacle and is radially collapsed to release said retaining means from said actuating means.

4,537,252

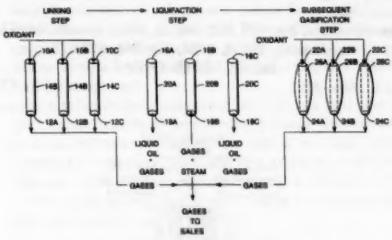
METHOD OF UNDERGROUND CONVERSION OF COAL

Rajen Puri, Tulsa, Okla., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 371,108, Apr. 23, 1982, abandoned. This application Jan. 20, 1984, Ser. No. 572,737

Int. Cl.³ E21B *43/247, 43/30*

U.S. Cl. 166—245 **5 Claims**



1. A method of converting to gaseous and liquid products coal and other solid carbonaceous material contained in a coal seam provided with a plurality of well groupings, each grouping comprising at least two pairs of wells comprising the steps of:

(a) injecting an oxygen containing gas into at least a pair of wells in a grouping;

(b) initiating combustion between said first pair of wells in said grouping and a second pair of wells in said grouping, said combustion linking said wells and producing syngas;

(c) thereafter blocking wells into which oxygen was injected in step (a), thereby providing blocked wells;

(d) injecting syngas and steam into a well in said first grouping linked to a blocked well in said grouping and removing liquid and gaseous products from at least one adjacent well in said first grouping, thereby leaving char;

(e) unblocking wells blocked in step (c) in said first grouping and introducing an oxygen containing gas into said wells to gasify coal and char therein by combustion;

(f) removing syngas from wells in communication with wells having oxygen injected thereinto in step (e); and

(g) repeating the sequence of steps (a) to (e) in a subsequent grouping of wells and utilizing a portion of the syngas produced in the steps (b) and (f) as the feed to step (d) carried out in said subsequent grouping.

4,537,253

MICELLAR SLUG FOR OIL RECOVERY

Hiroshi Morita, Chiba; Yasuyuki Kawada, Funabashi; Junichi Yamada, and Toshiyuki Ukigai, both of Chiba, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 415,840, Sep. 8, 1982,. This application Mar. 31, 1983, Ser. No. 480,863

Claims priority, application Japan, Oct. 9, 1981, 56-160296; Mar. 11, 1982, 57-37186

The portion of the term of this patent subsequent to Apr. 23, 2002, has been disclaimed.

Int. Cl.³ E21B *43/22*

U.S. Cl. 166—274 **6 Claims**

1. A micellar slug for use in the recovery of oil from subterranean reservoirs, said slug consisting essentially of a hydrocarbon, in the amount of about 2% to about 90% by weight, an aqueous medium, in the amount of about 4% to about 95% by weight, a surfactant in the amount of about 1% to about 3% by weight, and a cosurfactant in the amount of about 0.1% to about 20% by weight, said surfactant containing, as an essential component, an alpha-olefin sulfonate having 10 to 26 carbon atoms and containing 0.5% to 12% by weight of disulfonate said micellar slug further containing an aqueous component which is oil-phase water included from the subterranean reser-

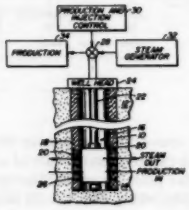
voir which has an inorganic salt concentration of about 5% to 25%, so that the total inorganic salt concentration, after inclusion of the oil-phase water, is in the range of about 2% to 20%.

4,537,254

STEAM INJECTION WELL GRAVEL PACK MATERIAL OF SINTERED BAUXITE

Thomas D. Elson, Chino, and Ralph S. Millhone, Brea, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 455,372, Jan. 3, 1983, abandoned. This application Jul. 5, 1984, Ser. No. 628,010
Int. Cl.³ E21B *43/04*
U.S. Cl. 166—278 **1 Claim**



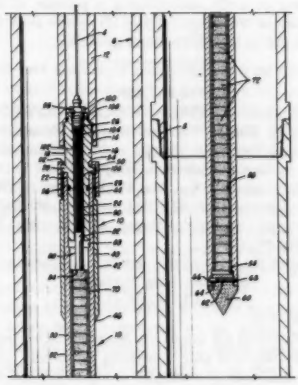
1. A method for reducing particulate material pack dissolution in subsurface wellbore environment comprising installing a pack material consisting essentially of sintered bauxite without a binder material in the subsurface wellbore as said pack particulate material and passing hot well fluids including steam into or out of said subsurface through said sintered bauxite.

4,537,255

BACK-OFF TOOL

John A. Regalbuto, and Jack E. Dines, both of Fort Worth, Tex., assignors to Jet Research Center, Inc., Arlington, Tex.

Filed Jun. 22, 1983, Ser. No. 506,739
Int. Cl.³ E21B *23/00*
U.S. Cl. 166—297 **15 Claims**



15. A method of backing off a conduit joint in a well bore, comprising:

disposing, adjacent said joint, an explosive in the form of a plurality of mutually abutting explosive pellets in a non-metallic housing adapted to substantially disintegrate upon detonation of said explosive;

pressurizing said explosive to substantially the level of pressure in said well bore adjacent said joint;

applying torque to said joint;

detonating said explosive and substantially disintegrating said housing while maintaining said torque; and

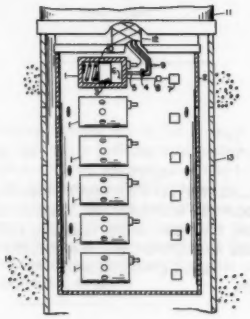
backing off said joint subsequent to said detonation of said explosive and disintegration of said housing.

4,537,256

SONIC FRACING PROCESS AND MEANS TO CARRY OUT SAID PROCESS

Franklin Beard, 2900 Wilcrest, Houston, Tex. 77079

Filed Jun. 13, 1983, Ser. No. 503,595
Int. Cl.³ E21B *43/26*
U.S. Cl. 166—299 **4 Claims**



1. In a formation stimulator, means mountable within a well casing for creating successive sonic waves in a production formation by controlled explosions in measured series said means for creating sonic waves has a housing, a plurality of cylinders within said housing, reciprocable pistons in said cylinders, means for introducing fuel into said cylinders, port holes in said cylinders through which exhaust gases from said fuel pass into the formation when said fuel has been ignited and said pistons are in one position.

3. The method of fracing a production formation, introducing a series of explosions creating a flow of exhaust gas in the well casing opposite a perforated area therein, said gas carrying its thermal properties into the adjacent production formation, said series having three successively greater explosions, creating reciprocating sonic waves in the formation, fracing the formation and forming passageways into the well casing.

4,537,257

SUBMERSIBLE PUMP

David B. Todd, Calgary, Canada, assignor to Shell Oil Company, Houston, Tex.

Filed Mar. 16, 1984, Ser. No. 590,312
Int. Cl.³ E21B *43/00*
U.S. Cl. 166—369 **6 Claims**

1. A method for isolating a well casing from the fluids in a well being produced by a submersible pump, said method comprising:

enclosing and sealing the submersible pump in a cylindrical shell;

attaching the top of the cylindrical shell to the production tubing string;

attaching a packer to the lower end of a tubing section projecting from the lower end of the cylindrical shell;

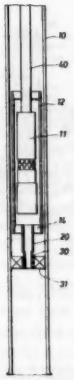
lowering the pump and production tubing into the well; and

seating said packer to seal the annular space between the well casing and the cylindrical shell.

5. An apparatus for producing hydrocarbon fluids contain-

ing corrosive fluids from a well using a submersible pump having suction and discharge openings while isolating the well casing from the fluids, said apparatus comprising:

a cylindrical shield member having closed ends, said submersible pump being disposed in said cylindrical shield with means for fluid communication between the lower closed end of the shield and the suction opening of the pump;



a production tubing string, said tubing string being secured to the other of the closed ends of the shield member;

a short tubing section, said short tubing section being secured to the lower closed end of the shield member; and

a hydraulically setable packer, said packer being attached to said short tubing string, whereby said packer when set will close the annular space between said short tubing string and said well casing.

4,537,258

LOW PRESSURE RESPONSIVE DOWNHOLE TOOL

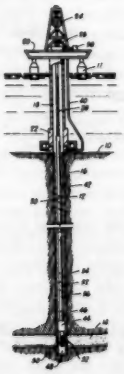
Harold K. Beck, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Sep. 19, 1983, Ser. No. 533,835

The portion of the term of this patent subsequent to Dec. 25, 2001, has been disclaimed.

Int. Cl.³ E21B *34/08*

U.S. Cl. 166—374 **38 Claims**



1. An annulus pressure responsive downhole tool apparatus, comprising:

a tool housing;

a power piston slidably disposed in said housing;

a first pressure conducting passage means for communicating a well annulus with a first side of said power piston;

a second pressure conducting passage means for communicating said well annulus with a second side of said power piston;

retarding means, disposed in said second pressure conducting passage means, for delaying communication of a sufficient portion of an increase in well annulus pressure to said second side of said power piston for a sufficient time to allow a pressure differential from said first side to said second side of said power piston to move said power piston from a first position to a second position relative to said housing; and

pressure relief means, communicated with a first portion of said second pressure conducting passage means between said second side of said power piston and said retarding means, for relieving from said first portion of said second pressure conducting passage means a volume of fluid sufficient to permit said power piston to travel to its said second position.

4,537,259

BLADE CONTROL DEVICE

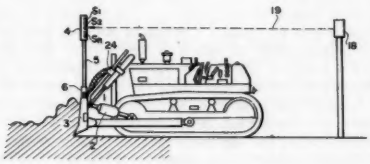
Tetsuji Funabashi, and Shingo Kobayashi, both of Hiratsuka, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Oct. 26, 1982, Ser. No. 436,841

Claims priority, application Japan, Oct. 26, 1981, 56-171064; Nov. 25, 1981, 56-188553; Nov. 25, 1981, 56-188554

Int. Cl.³ E02F *3/76, 3/85*

U.S. Cl. 172—4.5 **6 Claims**



6. A blade control device comprising:

a blade;

a light receiving device mounted to the blade so as to be movable in vertical directions;

a light receiving device controlling system means for positioning, when in an automatic leveling mode where said blade is automatically controlled using a reference surface formed by a laser beam, said light receiving device to a height corresponding to a command value;

a lift cylinder control system means to which, when in the automatic leveling mode, a deviation signal representative of the deviation of the light receiving position of said light receiving device with respect to the laser beam projecting at a predetermined height is provided, for lifting or lowering the blade so as to eliminate said deviation;

a manual control means for producing a manual control electronic signal output indicative of desired lifting or lowering of the blade in a manual operation; and

switching means for inputting the signal output of said manual control means, instead of said command value, to said light receiving device controlling system means during manual operation, and for inputting said command value to said light receiving device controlling system means during the automatic leveling mode after the manual operation is finished, said lift cylinder control system means being free from receiving signals from said light receiving device during manual operation, and said light receiving device controlling system means being operable

by said deviation value to move said light receiving device vertically relative to said blade during said manual operation.

4,537,260

APPARATUS WITH REAR AND FRONT POWER LIFT, COMMON REGULATING AND CONTROL ELEMENTS, AND CHANGEOVER VALVE

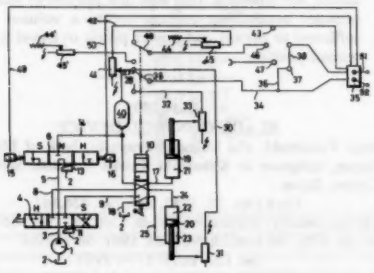
Herbert Knepper, Brühl, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Apr. 12, 1983, Ser. No. 484,190

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1982, 3214206

Int. Cl.³ A01B *63/112*

U.S. Cl. 172—9 **8 Claims**



1. In an apparatus having coupled therewith a rear and a front hydraulic power lift for raising and lowering implements, with each power lift including a lifting cylinder; actuation of the rear power lift being a function of not only pick-up determined measurement of values of respectively working resistance and position, comparison values of respectively working resistance and position, and mixed values of respectively working resistance and position of an implement as well as cylinder pressure, but also of random setting of the rear power lift; said apparatus having the improvement therewith comprising function regulating elements in common for the rear and the front power lifts, an operation control element in common for the rear and the front power lifts, and a changeover valve in common with both of said lifting cylinders for effecting actuation of the rear power lift as a function of the aforementioned values, and for effecting actuation of the front power lift, even for a single operation, as a function of at least one of said aforementioned values also applicable for operation said rear power lift; said lifting cylinders of said power lifts being connectible with said regulating elements and said control element, respectively via intervention of said changeover valve, in such a way that one of said lifting cylinders can be controlled as to operation while the other lifting cylinder can be regulated as to function, and vice versa.

4,537,261

COMBINED CHISEL PLOW, ROD WEEDER AND DRILL

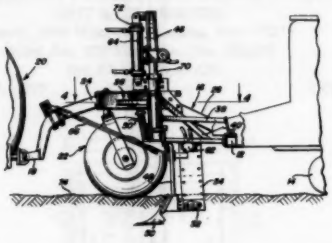
Paul H. Hatzell, 1733 Hwy. 87 East, Billings, Mont. 59101

Filed Mar. 1, 1984, Ser. No. 585,240

Int. Cl.³ A01B *39/19, 49/06*

U.S. Cl. 172—44 **7 Claims**

1. In combination with a seeder of the type including a main frame supporting a plurality of laterally spaced rear seeder units and equipped with a forwardly projecting hitch assembly including dependingly supported ground engaging wheel means, said hitch assembly including forward hitch means for coupling to the rear of a tractor and mounting frame means intermediate the hitch means and the rear portion of said hitch assembly, a pair of generally aligned, axially spaced and transversely extending opposite side tool bars disposed on opposite sides of said ground wheel means, a pair of laterally spaced upstanding guide and support members projecting upwardly from adjacent ends of said tool bars, said mounting frame including guide means from which said guide and support members are supported for guided vertical shifting, a cross-head assembly extending between and connecting the upper ends of said guide and support members, lift means operatively connected between said cross-head assembly and said hitch assembly for raising and lowering said cross-head assembly



relative to said hitch assembly, said mounting frame means and the remote ends of said tool bars including coacting guide means guiding said remote ends against rearward displacement relative to said main frame, a plurality of tool shanks dependingly supported from each of said tool bars, sweep means mounted from the lower ends of said tool shanks, shaft journal means supported from said sweep means in trailing relation relative thereto, and driven rod weeder shaft means journaled from and extending between said journal means rearward of said wheel means.

4,537,262

SOIL CULTIVATION

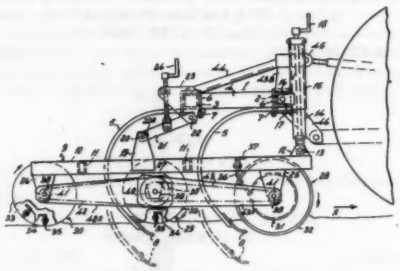
Cornelis van der Lely, 7 Brüschenrain, Zug, Switzerland

Filed Jun. 15, 1983, Ser. No. 504,414

Claims priority, application Netherlands, Jun. 23, 1982, 8202530

Int. Cl.³ A01B *49/02*

U.S. Cl. 172—146 **14 Claims**



1. A soil cultivating machine comprising a carrying frame and a plurality of cultivating members arranged on said frame, said cultivating members comprising three rollers arranged in series transverse to the machine's direction of travel during operations, said rollers being provided with cultivating elements and being drivably interconnected with each other during operation, the machine further comprising a framework and further cultivating members, said framework supporting said further cultivating members, said rollers being mounted on said carrying frame, said framework being adjustably connected to said carrying frame by two independently operable

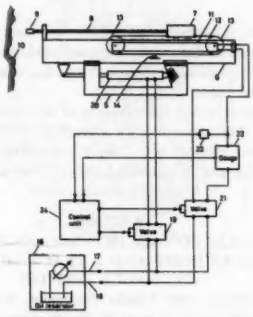
height adjustment means at two respective horizontally spaced apart locations so that said carrying frame and said rollers mounted thereon are movable as a whole relatively upwardly and downwardly with respect to said framework to which said further cultivating members are fastened, said rollers serving to establish the working depth of said further cultivating members.

4,537,263

METHOD AND MEANS FOR ADJUSTING THE FEED SUPPORT OF A ROCK DRILLING UNIT INTO A GIVEN DISTANCE FROM THE DRILLING LOCATION

Hakon E. Bjor, Hvalstad, Norway, assignor to Ingenior Thor Furuholmen A/S, Oslo, Norway

Filed Apr. 26, 1982, Ser. No. 372,237
Claims priority, application Norway, Apr. 29, 1981, 811458
Int. Cl.³ E21B 15/04
U.S. Cl. 173—1 13 Claims



1. A method for positioning at a predetermined distance from a rock surface into which holes are to be drilled a feed support of a rock drilling unit of the type including a carrier supporting said feed support for longitudinal movement relative thereto, first hydraulic means for moving said feed support longitudinally with respect to said carrier, a drilling machine mounted on said feed support for longitudinal movement relative thereto, a drill stem supported by said drilling machine and movable therewith, a drill bit fixed to an end of said drill stem, second hydraulic means for moving said drilling machine, said stem and said bit longitudinally with respect to said feed support, and means for measuring the depth of a drilled hole as a function of the relative position of said drilling machine with respect to said feed support, said method comprising:

operating said second hydraulic means and thereby moving said drilling machine, said stem and said bit toward said rock surface until said bit abuts said rock surface;

operating said first hydraulic means to move said feed support toward said rock surface, while maintaining said bit in abutment with said rock surface, whereby said feed support moves relative to said drilling machine; and

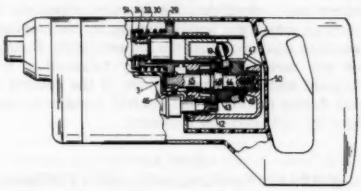
stopping operation of said first hydraulic means and thereby movement of said feed support when said depth measuring means determines that said feed support has reached a position spaced said predetermined distance from said rock surface, as a function of the relative position of said bit, and thereby of said drilling machine, with respect to said feed support.

4,537,264

POWER-DRIVEN HAND TOOL

Wolfgang Schmid, Plattenhardt; Karl Wanner, Echterdingen; Jorg Fälchle, Bempflinge; Manfred Bleicher, and Frank Müller, both of Leinfelden, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 279,036, Jun. 30, 1981, Pat. No. 4,456,076, which is a continuation-in-part of Ser. No. 950,585, Oct. 12, 1978, Pat. No. 4,280,359, which is a continuation of Ser. No. 810,959, Jun. 29, 1977, abandoned, which is a continuation-in-part of Ser. No. 615,904, Sep. 28, 1975, abandoned. This application Mar. 19, 1984, Ser. No. 590,877
Claims priority, application Fed. Rep. of Germany, Oct. 16, 1974, 2449191
The portion of the term of this patent subsequent to Jul. 28, 1998, has been disclaimed.
Int. Cl.³ E02D 7/02
U.S. Cl. 173—48 2 Claims



1. A power-driven hammer drill, comprising a housing; a tool chuck on said housing and adapted to hold an elongated tool; means for impacting said tool chuck in direction lengthwise of the tool, including a guide tube coaxial with said tool chuck, and a piston which is slidingly received and reciprocable in said guide tube in said direction, said piston having one end portion facing towards said tool chuck and another end portion facing away therefrom, said other end portion being formed with a bore extending transverse to said direction; and drive means for said impacting means, comprising a driven rotatable shaft mounted for rotation about an axis paralleling said direction, a drum coaxially mounted on said shaft freely turnably surrounding the same and having a circumferential surface formed with a circumferentially complete cam track formed as a groove having an axial flank shaped to act as a wobble plate, coupling means for coupling said drum for joint rotation with said shaft, and transmitting means guided by said cam track and operatively connected with said piston for transmitting reciprocatory motion to the same in response to rotation of said drum with said shaft, said transmitting means comprising a ring freely turnably received in said groove and a projection extending substantially radially from said ring and slidably received in said bore of said other end portion of said piston, said coupling means comprising cooperating first and second coupling portions on said shaft and said drum, respectively, and said shaft being axially shiftable relative to said drum between two positions in which said first and second coupling portions are engaged and disengaged, respectively.

4,537,265

SELF PROPELLED REVERSIBLE BORING RAM

William E. Cox, Woodbridge, and Kenneth L. Hemmings, Colchester, both of England, assignors to British Telecommunications, London, England

Filed Apr. 22, 1983, Ser. No. 487,767
Int. Cl.³ E21B 4/14, 7/26, 11/02
U.S. Cl. 175—19 10 Claims

1. A self-propelled reversible boring ram comprising a tubular body which contains a reciprocable hammer and a pneumatically balanced reciprocable control member for supplying working fluid to the hammer in either a forward motion mode position or a reverse motion mode position,

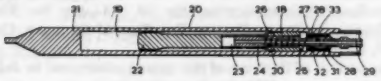
said control member having oppositely directed piston surfaces which are at all times subjected to substantially balanced pneumatic forces from said working fluid in both said reverse and forward mode positions.

6. A self-propelled reversible boring ram comprising:

a tubular body;

a hammer contained within the body, said hammer being reciprocable by working fluid supplied to the ram; and

a pneumatically balanced control member movable between



a forward position for advancing the ram and a reversing position, rearwards of the forward position, for reversing the ram;

wherein said control member includes oppositely directed surfaces which are both subjected to the pressure of the working fluid such that the net pneumatic fluid pressure on said member is substantially balanced at both said forward and reversing positions of the control member and during motion of the control member between said forward and reversing positions.

4,537,266

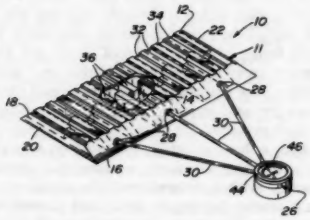
PORTABLE AND COMPACTIBLE SCALE

Mitchell H. Greenberg, 796 Sport Hill Rd., Easton, Conn. 06612

Filed Dec. 30, 1983, Ser. No. 567,032

Int. Cl.³ G01G *5/04, 21/00*

U.S. Cl. 177—208 **8 Claims**



1. A portable and compactible scale characterized by a flexible, compactible bladder providing an interior chamber, said bladder including a flexible top wall adapted to support a load to be weighed and a flexible bottom wall adapted to conform to a scale-supporting surface; a non-compressible fluid filling the closed chamber and spaced-apart compressible elongated support members extending along said top wall in a first direction and downwardly from the top wall each of said support members terminating short of the bottom wall under no-load conditions, said top wall being more rigid in areas including the support members than in other areas, said elongated members defining therebetween plural, spaced-apart, substantially parallel flexure regions extending in said first direction about which said scale can be bent to compact the scale.

4,537,267

BELT TENSIONING MECHANISM

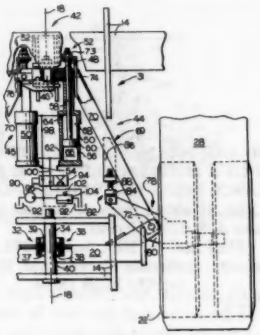
Ronald L. Satzler, Princeville, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 20, 1983, Ser. No. 563,719

Int. Cl.³ B62D *55/08*

U.S. Cl. 180—9.1 **13 Claims**

1. A belt tensioning mechanism for use on a vehicle having a frame defining a plane aligned along its longitudinal axis, an axle connected to the frame at one end of the vehicle and extending thereacross through said plane, a first pair of wheel assemblies rotatably mounted on opposite ends of the axle independent of said frame, a second pair of wheel assemblies drivably mounted on opposite sides of the frame at the other end of the vehicle, and first and second inextensible belts respectively enstrained about the wheel assemblies on each side of the vehicle, comprising:



means for universally swiveling said axle relative to said frame and said centrally disposed plane and for sliding said axle longitudinally relative to said frame and said centrally disposed plane; and

means for adjusting the position of said axle relative to said frame to maintain at least a predetermined tension in said first and second belts while permitting said universal swiveling and longitudinal movements of said axle.

4,537,268

HYDRAULIC CONNECTION MEANS BETWEEN A VEHICLE BODY AND A TRACK-MOUNTED HYDRAULIC MOTOR

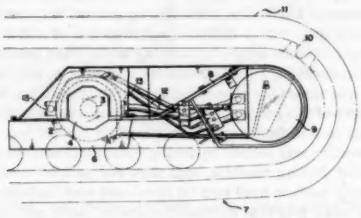
Akira Fukushima, and Yutaka Sugimoto, both of Komatsu, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Oct. 24, 1983, Ser. No. 544,895

Claims priority, application Japan, Oct. 25, 1982, 57-160216[U]

Int. Cl.³ B62D *65/00*

U.S. Cl. 180—9.1 **3 Claims**



1. A hydraulically driven track-type vehicle including pivot shafts which respectively extend inside pivot shaft casings projecting outwardly on both sides of the vehicle body in a cantilevered manner, one end of each of said pivot shafts being fixedly secured to the vehicle body and the other end thereof being supported by the leading end of each of the pivot shaft casings, and track frames mounted on both sides of the vehicle and pivotally supported through track frame mounting members by the respective leading ends of said pivot shafts, charac-

terized in that said vehicle comprises flexible pipes connected between respective one ends of hydraulic fluid passages formed in said track frame mounting members and hydraulic fluid pipes mounted on the vehicle body, and conduits connected between hydraulic motors respectively mounted on the rear portions of said track frames and respective other ends of said hydraulic fluid passages.

4,537,269

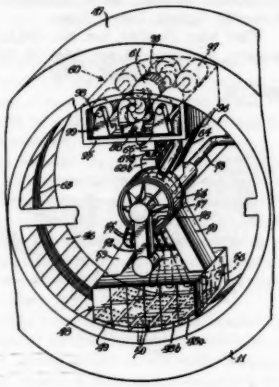
VEHICLE WITH PNEUMATIC ASSEMBLY FOR DRIVING, BRAKING, AND REDUCING FRICTION ON BEARINGS

William M. Fisher, 2017 Plainfield, Des Plaines, Ill. 60018

Division of Ser. No. 166,472, Jul. 7, 1980, Pat. No. 4,360,222. This application Sep. 30, 1982, Ser. No. 429,789

Int. Cl.³ B60K *3/00*

U.S. Cl. 180—10 **12 Claims**



1. A pneumatic drive assembly in which a drive wheel is adapted to engage a track, comprising:

a frame,

a drive wheel mounted to a drive shaft, said drive shaft being supported by said frame and movable relative to said frame,

an enclosed chamber supported by said frame, said chamber defining first and second openings,

a conduit communicating with said first opening in said chamber for providing air to said chamber,

means for regulating the entry of air into said chamber, whereby an operator can have air admitted into said chamber or substantially prevent air from entering said chamber,

a second conduit having one end in communication with said second opening in said chamber,

pneumatic cylinder means in communication with the other end of said second conduit, said pneumatic cylinder being supported by said frame and movable between an unextended position and an extended position,

means for operably connecting said pneumatic cylinder means to said drive shaft,

whereby when air is admitted into said chamber, said air exits said chamber into said second conduit, moves said pneumatic cylinder means from said unextended position to said extended position, and thereby moves said drive shaft and drive wheel from a first position in which said drive wheel is spaced apart from said track to a second position in which said drive wheel engages said track.

4,537,270

BEARING ARRANGEMENT FOR A DRIVEN WHEEL OF A VEHICLE

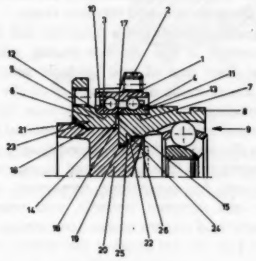
Manfred Brandenstein, Eussenheim, and Rüdiger Hans, Niederwerrn, both of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed May 26, 1983, Ser. No. 498,278

Claims priority, application Fed. Rep. of Germany, May 26, 1982, 3219745

Int. Cl.³ F16C *35/04*

U.S. Cl. 180—70.1 **4 Claims**



1. In a bearing arrangement for the driven wheel of a vehicle, comprised of a rolling bearing having an outer ring with a flange for affixing the bearing arrangement to a vehicle frame and an inner ring, a wheel hub having a flange for supporting a wheel, a drive joint for driving said wheel hub, and means for holding said wheel hub, said drive joint and said inner ring together, the improvement wherein said wheel hub and said drive joint each have an end surface, a first shoulder surface, a second shoulder surface, and a bore surface, said inner ring being seated on the outer surface of at least one of said wheel hub and drive joint, between and in contact with said first shoulder surfaces, said end faces being arranged to confront each other and formed to engage each other in an interlocking relationship such that torque is transmitted from said drive joint to said wheel hub, and wherein said holding means comprises a pin extending through said wheel hub and drive joint and contacting said bore surfaces, said pin having radially extending projections arranged to engage said second shoulder surfaces of said wheel hub and drive joint, respectively.

4,537,271

RUNNING VEHICLE

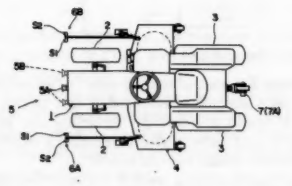
Katsumi Ito, Osaka, and Osami Fuziwara, Kishiwada, both of Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed May 26, 1983, Ser. No. 498,512

Claims priority, application Japan, Oct. 27, 1982, 57-188386

Int. Cl.³ B60T *7/12*; B62D *1/24*; G08G *11/00*

U.S. Cl. 180—131 **11 Claims**



11. A self-propelled vehicle controllable to follow a path and to avoid obstacles comprising a plurality of obstacle sensor means arranged on the vehicle so as to establish respective different sensing areas transversely of the vehicle, boundary sensor means for detecting a boundary between a treated re-

gion and an untreated region, distance sensor means for detecting a traveling distance of the vehicle, and obstacle-detection means for judging the presence of obstacles, said obstacle-detection means including:

means to actuate said obstacle sensors at a predetermined time interval,

determining means to determine a position of an obstacle by measuring a distance to the obstacle when at least one of said obstacle sensors detects the obstacle and to define a transverse range of the obstacle relative to the vehicle by a combination of said obstacle sensors, said determining means for deciding the position of the obstacle on the basis of said distance and said traverse range,

pattern means to determine a direction and distance pattern of movement of the obstacle during said time interval when at least one of said obstacle sensors continually detects the obstacle on the basis of (i) the position of the obstacle being determined at a first time, (ii) the position of the obstacle being determined at a second time, and (iii) a distance the vehicle has advanced during said time interval between said first and second times, and

control means for controlling movement of said vehicle relative said detected obstacle, said control means, in response to said pattern means determining that the obstacle is at rest, for (a) causing the vehicle to sequentially advance to a predetermined distance to the obstacle, steer toward the treated region, advance a predetermined distance, steer toward the untreated region, and finally return to an original traveling mode following said path upon detection by said boundary sensor means of said boundary between the treated region and the untreated region, and (b) for stopping the vehicle when said pattern means determines that the obstacle is in motion.

4,537,272

AUTOMOTIVE VEHICLE SPEED CONTROL DEVICE BASED ON A PRESELECTED SPEED

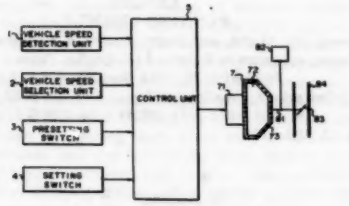
Kou Tanigawa, Akashi; Jiro Masuda, Kobe; Kazumasa Nakamura, Okazaki, and Kazuhiko Hayashi, Toyota, all of Japan, assignors to Fujitsu Ten Limited, Kobe and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Jan. 25, 1983, Ser. No. 460,857

Claims priority, application Japan, Jan. 25, 1982, 57-10635; Jan. 25, 1982, 57-10638

Int. Cl.³ B60K *31/00*

U.S. Cl. 180—176 **5 Claims**



1. A device for controlling the speed of an automotive vehicle based on a selected vehicle speed, said device comprising:

a vehicle speed detector for detecting the actual vehicle speed of said vehicle and generating a signal representative of said actual vehicle speed;

an actual speed setting switch for enabling speed control based on a desired actual vehicle speed;

adjustable speed selection means for generating a signal in accordance with a preselected vehicle speed from within a predetermined range of speeds;

a selected speed presetting switch for enabling speed control based on said preselected vehicle speed;

a pneumatic actuator for changing the opening degree of a throttle valve;

control means responsive to signals from said vehicle speed detector, said actual speed setting switch, said adjustable speed selection means and said selected speed presetting switch, for generating a signal for controlling said pneumatic actuator by comparing said detected actual vehicle speed to either said preselected vehicle speed or said desired actual vehicle speed, wherein vehicle speed may be selectively controlled in accordance with the detected actual vehicle speed when said actual speed setting switch is actuated and in accordance with said preselected vehicle speed when said selected speed presetting switch is actuated.

4,537,273

RADIATOR SYSTEM FOR MOTORCYCLE

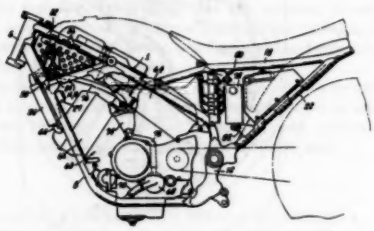
Katsunori Funabashi, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 19, 1983, Ser. No. 496,127

Claims priority, application Japan, May 24, 1982, 57-87789

Int. Cl.³ B60K *11/04*

U.S. Cl. 180—229 **5 Claims**



3. A radiator system for motorcycles comprising

a frame body having left and right main frame sections and left and right down tube sections, with the front ends of the sections being connected by means of a head pipe and intermediate points of the sections connected by left and right front stays;

a radiator having a filling tube and filler cap attached to the upper end of said filling tube, wherein said radiator is mounted in front of the left and right down tube sections in such a manner that the filler cap is located within a chamber bounded by the main frame section, head pipe, down tube section and front stays;

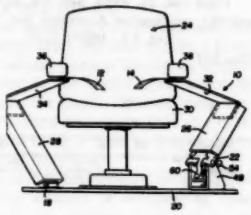
a pair of cover plates, detachably mounted on each side of the frame body between said main frame sections, down tube sections and front stays wherein the cover plates each consist of a perforated plate having curved, alternately spaced and oppositely facing holding flanges affixed to the top thereof and an arm located on the lower front edge of the cover plate mounted at a right angle and facing inward from the cover plate, said arm having a slot passing through the arm so as to accommodate a tab located on the down tube section; and

a locking means comprising a locking plate mounted at the junction of the main frame section and down tube section and a bolt wherein the locking plate has a threaded aperature which is aligned with a locking aperture in the cover plate such that the bolt may be inserted through the locking aperature and threaded into the locking plate and tightened thereby securing the cover plate to the frame body.

4,537,274
SEAT BELT ASSEMBLY

Donald J. Parquet, Burlington, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed Oct. 15, 1984, Ser. No. 660,824
Int. Cl.³ B60R 21/10
U.S. Cl. 180—270 6 Claims



1. A seat belt assembly for use in connection with an operator's chair which is mounted on a frame, said seat belt assembly comprising:

first and second opposed straps and means for securing one end of said first strap to one end of said second strap, the other end of said first strap secured to said frame and the other end of said second strap connected to a rotatable support member;

said straps inserted through open flexible shield members which are positioned on opposed sides of said operator's chair, spring members extending from said shield members to positions beneath and slightly inwardly of arms on said chair, and said straps supported by said spring members such that said spring members cause discomfort to an operator who fails to buckle said straps together in front of him; and

switch means secured to a mounting bracket on said frame, said support member rotatably attached to said mounting bracket, spring means for normally biasing said support member against a stop on said mounting bracket, and a spring actuator member mounted on said support member for actuating said switch means when said support member is rotated in response to the securing of said straps together.

4,537,275
VIBRATION RESPONSIVE MOUNTING ARRANGEMENT FOR AUTOMOTIVE ENGINE

Akira Kimura, Zushi; Masao Ishihama, Yokosuka; Toshiro Abe, Yokohama; Kiyoshi Shimada, and Shinichi Matsui, both of Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 30, 1982, Ser. No. 454,546
Claims priority, application Japan, Jan. 8, 1982, 57-927[U]
Int. Cl.³ B60G 17/00
U.S. Cl. 180—300 13 Claims

1. A mounting arrangement for suspending a vibrating body on a base member comprising:

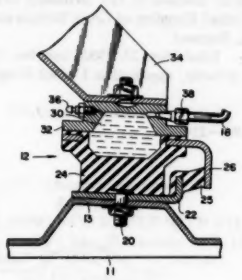
an insulator supportingly interposed between said vibrating body and said base member;

means defining a variable volume chamber, said variable volume chamber defining means being connected in series with said insulator;

a a pulsation pump which produces pressure pulsations in a timed relationship with a predominant vibration of said vibrating body;

a non-pressurized reservoir communicating with said pulsation pump;

means fluidly interconnecting said pulsation pump and said variable volume chamber; and

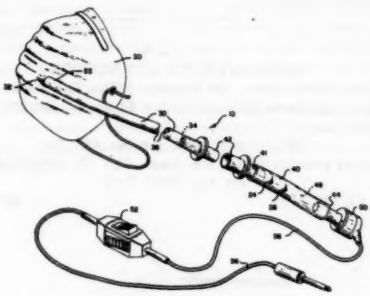


valve means in said fluidly interconnecting means for varying the amount of fluid fed into said variable volume chamber per pulsation produced by said pulsation pump.

4,537,276
MASK/MICROPHONE SYSTEM FOR VOICE ACTUATED CONTROL

Richard G. Confer, Erie, Pa., assignor to American Sterilizer Company, Erie, Pa.

Filed Sep. 7, 1984, Ser. No. 648,805
Int. Cl.³ G10K 11/00
U.S. Cl. 181—21 7 Claims



1. A device for use with a microphone for transmitting sound from a speaker in a first area to a second area outside of the first area, comprising:

a sound conduit having an inlet and an outlet of a length sufficient to permit placement of said inlet in the first area and placement of said outlet in the second area;

means for securing said inlet in an operative position relative to the speaker's mouth; and

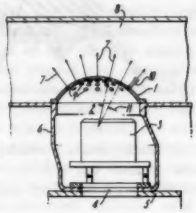
a coupler connected to said outlet for acoustically coupling said microphone to said outlet, said coupler forming a hollow tube and having a plurality of holes in said tube for adjusting the sound pressure transmitted through said conduit to said microphone, said holes, when covered, increasing the sound pressure in said tube.

4,537,277

SILENCER FOR HIGH VELOCITY GAS FLOW

William D. Bryce, Farnham, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Nov. 23, 1983, Ser. No. 554,703
Claims priority, application United Kingdom, Dec. 3, 1982, 8234633
Int. Cl.³ B64D 33/02
U.S. Cl. 181—214 4 Claims



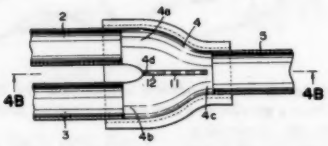
1. A silencer incorporated in a bypass duct of a jet engine, the silencing means having:
an air bleed passage,
the air bleed passage connected at a first end to an air bleed valve,
the air bleed valve controlling the output of high pressure air from the engine core to the air bleed passage,
at a second end of said air bleed passage a terminating plate, the terminating plate being domed and perforated, said perforations being distributed over the surface of said plate so as to direct gas issuing from said passage to form a plurality of diverging jets, said jets mixing with the gas flowing in the bypass duct, whereby
noise produced by said divergent jets and bypass gases have a frequency at maximum intensity in a range of the audible spectrum at which human auditory perception is relatively insensitive.

4,537,278

EXHAUST DUCT CONNECTOR

Makoto Okada, Tokyo, and Kazunori Fujita, Tachikawa, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Oct. 5, 1984, Ser. No. 658,214
Claims priority, application Japan, Oct. 20, 1983, 58-197318
Int. Cl.³ F01N 7/08
U.S. Cl. 181—227 13 Claims



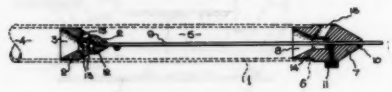
1. An exhaust duct connector for internal combustion engines, comprising:
(a) first means defining a substantially Y-shaped internal passage, both branches of the Y being adapted to receive a pair of upstream exhaust ducts and the leg of the Y being adapted to receive a downstream exhaust duct;
(b) a partition means coaxial with the leg of the Y and disposed at the junction of the branches of the Y, said partition means taking the form of a substantially thin plate having a plurality of small holes allowing exhaust flow therethrough.

4,537,279

TUNEABLE TUNED PIPE EXHAUST SYSTEM

Walraven Van Heeckeren, Studio 11, 17 Herbert St., St. Leonards, N.S.W., 2065, Australia

Filed Jul. 21, 1983, Ser. No. 515,981
Claims priority, application Australia, Jul. 22, 1982, PF 4998
Int. Cl.³ F01N 7/18
U.S. Cl. 181—241 6 Claims



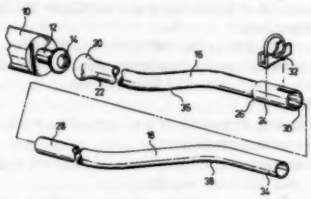
1. Tuneable means for the exhaust system of a two-stroke cycle internal combustion engine, comprising a baffle slidable longitudinally within an exhaust pipe of said exhaust system; a plug insertable into the free, downsteam end of said exhaust pipe; and means for selectively positioning said baffle within said exhaust pipe to thereby define therein an upstream primary chamber and a downstream secondary chamber; said baffle having a wave-reflecting upstream side constituted by a concavity of substantially conical configuration, and being provided with at least one conduit therethrough communicating said primary chamber with said secondary chamber; said plug having a wave-reflecting upstream side constituted by a concavity of substantially conical configuration, and being provided with at least one conduit therethrough communicating said secondary chamber with atmosphere; and said baffle positioning means including an elongated rod, one end of which is affixed to the downstream side of said baffle and the other end of which is adapted to extend through a co-acting bore extending longitudinally through said plug, said plug being provided with means to immobilize said elongated rod in said bore to thereby immobilize said baffle at a selected location within said exhaust pipe.

4,537,280

EXHAUST EXTENSION PIPE REPLACEMENT KIT

Peter Roberts, Mississauga, Canada, assignor to Thrush Incorporated, Rexdale, Canada

Continuation-in-part of Ser. No. 371,230, Apr. 23, 1982, Pat. No. 4,441,579. This application Mar. 23, 1984, Ser. No. 592,818
The portion of the term of this patent subsequent to Apr. 10, 2001, has been disclaimed.
Int. Cl.³ F01N 7/18
U.S. Cl. 181—243 13 Claims



1. A replacement exhaust extension pipe kit suitable for use with either a first vehicle that was originally equipped with a first tubular exhaust extension pipe having an inlet end connected to a catalytic converter, an intermediate region of predetermined first configuration, and an outlet end spaced apart from the inlet end by a first distance, or a second vehicle that was originally equipped with a second tubular exhaust

extension pipe having an inlet end connected to a catalytic converter, an intermediate region of predetermined second configuration, and an outlet end spaced apart from the inlet end by a second distance, said kit comprising:

a first tubular section having an inlet end for connecting to the catalytic converter, an intermediate portion configured to the spatial envelope of both the first and second configurations, and an outlet end spaced apart from said inlet end by a third distance;

a second tubular section having an inlet end and an outlet end spaced apart from the inlet end by a fourth distance, said second tubular portion having an intermediate portion configured to the spatial envelope of the first and second vehicle, the fourth distance being approximately the same as the third distance and the sum of the third and fourth distances being at least as long as the larger of the first and second distances;

packaging means for temporarily retaining the first and second tubular sections in overlapping relationship to provide a shipping package substantially shorter than either of said first and second distances; and

means permitting said outlet end of said first tubular section to be operatively connected to said inlet end of said second tubular section is gas flow relationship when said replacement tail pipe kit is being permanently installed in one of said first and second vehicles.

4,537,281

TWO PERSON AERIAL PLATFORM

Douglas W. Endres, Lexington; Kenneth D. McDaniel, Jr., Midway, and Francis J. Griebel, Lexington, all of Ky., assignors to FMC Corporation, Chicago, Ill.

Filed Oct. 9, 1984, Ser. No. 659,141

Int. Cl.[3] B66F *9/06, 11/04;* G06C *7/16*

U.S. Cl. 182—2 **3 Claims**

1. An aerial platform for attachment to the head machinery of a hydraulic crane, said machinery having a pair of mounting lugs extending from each side thereof, said platform comprising:

a pair of base plates, each plate having a pair of mounting ears complementary to and engageable with said lugs;

a cross tube attached at each end to said base plates;

a beam extending beyond and secured to said base plates;

a pair of braces, each brace attached to and extending between one of said base plates and the adjacent end of said beam;

a pair of suspension arms, each arm attached to one end of said beam and extending outward from said base plates at an obtuse angle; and

a personnel basket pivotally attached to the free ends of said arms.

4,537,282

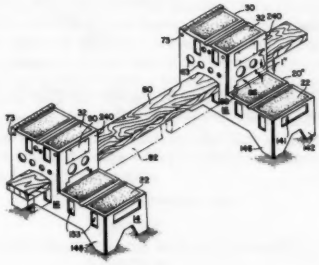
WORK HOLDING STACKABLE STEP STOOL

George H. Lobdell, Rte. 4 - Box 60, Canton, N.Y. 13617

Filed Mar. 27, 1984, Ser. No. 593,841

Int. Cl.[3] E04G *1/28*

U.S. Cl. 182—46 **21 Claims**



1. A device for use by a skilled craftsman comprising:

a formed body of non-corrosive plastic material;

said body configured to provide two planar step surfaces at different heights and two equal sides and two equal ends each having leg extensions for raising the body above a support surface, said two sides and two ends being substantially parallel and with a slight inward and upward taper so that a plurality of the devices can be stacked for storage purposes;

means with at least one of said two planar step surfaces for holding tubular material such as pipe to be worked on; and

further means provided in said sides for holding boards therewith.

4,537,283

LADDER ASSEMBLY

Arnold F. Humes, R.R. #1, Ganges, British Columbia, V0S 1E0, Canada

Filed Jul. 6, 1984, Ser. No. 628,665

Int. Cl.[3] E06C *5/04*

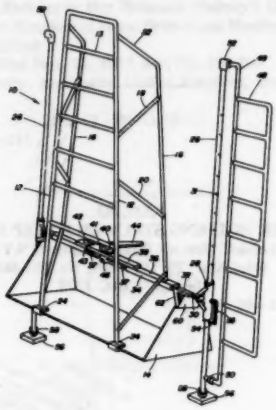
U.S. Cl. 182—127 **8 Claims**

1. A ladder assembly for use on an articulating member of a moveable vehicle, comprising;

(a) a main ladder mountable on said member;

(b) a truss assembly coupled to said main ladder and coupla-

ble to said articulating member supporting said main ladder; and



(c) bracing means affixed to said ladder assembly for bracing said main ladder from the ground.

4,537,284

LUBRICANT DISTRIBUTOR

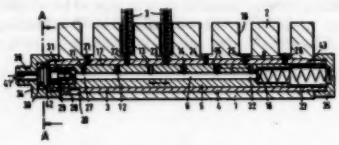
Otto Breisinger, Meersburg, and Herbert Burgbacher, Hilzingen, both of Fed. Rep. of Germany, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jun. 8, 1982, Ser. No. 386,229

Claims priority, application European Pat. Off., Jun. 19, 1981, 81810252.7

Int. Cl.³ F16N *25/02*

U.S. Cl. 184—7.4 **12 Claims**



1. A lubricant distributor comprising

a housing having a longitudinal axis and a plurality of feed channels disposed longitudinally along said axis and in axially spaced part relation to each other at a given spacing; and

a piston movably mounted within said housing, said piston including an axially disposed main channel for receiving lubricant and a plurality of radially disposed distribution channels in communication with said main channel to receive lubricant therefrom, said distribution channels being disposed longitudinally along said axis in axially spaced apart relation to each other at a spacing different from said given spacing and aligned with said feed channels whereby upon movement of said piston in said housing, each said distribution channel is progressively aligned with a respective one of said feed channels.

4,537,285

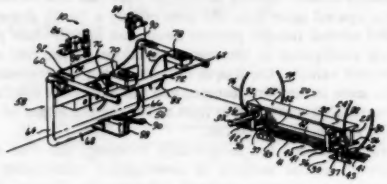
CONVEYOR LUBRICATING APPARATUS

Patrick A. Brown, 1490 South Stone Rd., and William C. Murphy, 9576 West 40th St., both of Fremont, Mich. 49412

Filed Apr. 11, 1983, Ser. No. 483,941

Int. Cl.³ F16N *29/00*

U.S. Cl. 184—15.2 **3 Claims**



1. A conveyor lubrication apparatus for a conveyor having a plurality of interconnected and movable elements arranged in a continuous, closed loop and movable in successive cycles about the loop and a central lubricant supply reservoir pressurized by a pump, the conveyor lubrication apparatus comprising;

fluid flow conduits connected to the central pumpdriven lubricant supply reservoir;

valve means disposed in fluid flow communication with the central lubricant supply reservoir by the fluid flow conduits and located in proximity with the conveyor for controlling the application of lubricant to the conveyor;

control means for controlling the energization of the valve means once for each pre-determined number of cycles of the conveyor past the lubrication apparatus, the control means including;

first detector means for detecting the presence of one particular element of the conveyor at the lubrication apparatus;

programmable counter means, responsive to the first detector means, for counting the number of cycles of the one particular element of the conveyor past the lubrication apparatus;

program means, connected as inputs to the counter means, for inputting count information to the counter means specifying the number of complete cycles of the conveyor past the lubrication apparatus between lubrication application;

the counter means providing an output specifying the application of lubricant to the conveyor during one cycle of the conveyor past the lubrication apparatus once for each programmed number of cycles of the conveyor past the lubrication apparatus;

second detector means for detecting the presence of the elements of the conveyor at the lubrication apparatus;

first timer means, responsive to the output of the counter means and the second detector means for energizing the valve means for a first pre-determined period of time to apply lubricant to the conveyor as the conveyor passes through the lubrication apparatus;

means for sensing current flow to the valve means;

second timer means, responsive to the output of the current sensing means, for providing an output signal for a second pre-determined period of time after current is initially applied to the valve means; and

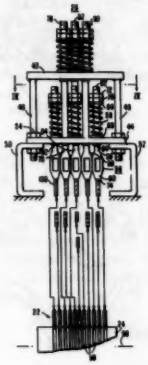
first switch means, responsive to the output of the second timer means, for conencting electrical power to the pump in the central lubricant supply reservoir only for the second pre-determined time period.

4,537,286

ELEVATOR SYSTEM

Arnold M. Morris, West Caldwell, and Jitendra K. Trivedi, West Milford, both of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 7, 1983, Ser. No. 540,069
Int. Cl.³ B66B 9/00
U.S. Cl. 187—1 A 8 Claims



1. A traction elevator system, comprising:

first and second movable components including an elevator car and a counterweight each mounted for guided, vertical movement between predetermined travel limits,

drive means for said first and second movable components, including first and second hitch plate means associated with said first and second movable components, respectively, for terminating the plurality of ropes,

at least one of said first and second hitch plate means including upper and lower, vertically spaced support plate members and rope termination means distributed substantially equally between said support plate members to reduce the maximum fleet angle as the associated movable component travels between its limits,

said upper and lower plate members each having horizontally oriented, major, flat surfaces,

said upper plate member being disposed directly above the lower, with their facing flat surfaces being in parallel planes, said upper and lower plate members being rigidly spaced to provide a fixed dimension between them,

each of said rope termination means including a rope socket, a shackle rod connected to each rope socket, and a shackle spring disposed about each shackle rod, with the shackle spring being a compression spring, co-acting with a flat major surface of a support plate member,

each of said first and second plate members cooperating with predetermined rope termination means to provide two spaced rope termination levels, with the shackle rods of a predetermined termination level proceeding through openings disposed in the plate member associated with the other termination level,

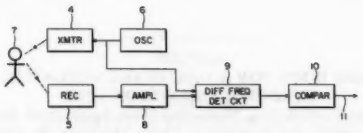
the ropes of the two termination levels being disposed such that the shackle rods are interleaved on one of the levels with a predetermined pattern in which a rod from one level is closer to a rod from the other level than it is to another rod from its same termination level.

4,537,287

APPARATUS FOR DETECTING ABNORMALITY IN THE CAGE OF AN ELEVATOR

Masahiro Noda, Ichinomiya, and Hiroshi Ando, Inazawa, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jun. 8, 1984, Ser. No. 618,739
Claims priority, application Japan, Jun. 17, 1983, 58-92815
Int. Cl.³ B66B 13/24
U.S. Cl. 187—29 R 10 Claims



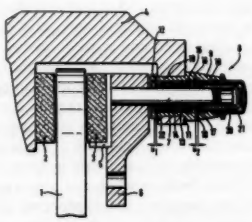
1. An apparatus for detecting any abnormality in a cage of an elevator, comprising a transmitter which continuously transmits an ultrasonic wave inwardly of the cage of the elevator, a receiver which receives an ultrasonic wave retrogressing in such a manner that the ultrasonic wave transmitted from said transmitter is reflected by an object within the cage, and a processing circuit which detects a speed of movement of the object within the cage on the basis of a magnitude of a difference between frequencies of the ultrasonic waves of said transmitter and said receiver and which decides that an abnormal condition exist within the cage when the difference frequency has become at least a preset value.

4,537,288

SPOT-TYPE DISC BRAKE FOR AUTOMOTIVE VEHICLES

Roberto Stoka, Nauheim, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Sep. 1, 1983, Ser. No. 528,396
Claims priority, application Fed. Rep. of Germany, Oct. 9, 1982, 3237515
Int. Cl.³ F16D 65/54
U.S. Cl. 188—71.8 9 Claims



1. A spot type disc brake for an automotive vehicle having a brake shoe on each side of a brake disc, and including a brake caliper straddling the brake disc and the brake shoes, a brake support member secured to the vehicle frame for receiving braking torque, a guide rod for slidably guiding the brake caliper on the brake support member, said brake caliper being provided with an actuating device to urge the brake shoes against the brake disc, said caliper being resiliently biased in the brake release direction and a friction element slidably supported by the brake support member for maintaining the resilient force constant independent of the thickness of pads on the brake shoes bearing against the brake disc, wherein said friction element is mounted within a tubular sleeve allowing movement of the element in an axial direction in a limited clearance dimension, and means on said sleeve for guiding the caliper to enable movement of said caliper axially in a brake

release direction a distance corresponding to the elastic expansion of the brake caliper in which the sleeve protrudes through a guide opening of the brake caliper and is provided with a projecting annular collar located at a distance from the brake caliper corresponding to the limited clearance dimension.

4,537,289

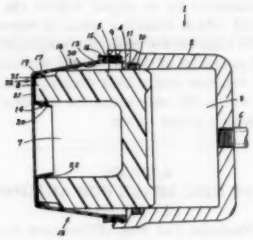
DUST BOOT FOR A DISC-BRAKE ACTUATING CYLINDER-AND-PISTON UNIT

Hubertus VonGrünberg, Bloomfield Hills; Jonathan M. Rowell, Birmingham, and Frederick C. Corey, Dearborn, all of Mich., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jun. 18, 1982, Ser. No. 389,739

Int. Cl.³ F16D *65/00*; F16J *15/52*

U.S. Cl. 188—97.4 **1 Claim**



1. A flexible sealing boot adapted for use as a disc brake dust boot to prevent contaminants from reaching the interface between a cylinder having a central bore with an open end thereof and a piston reciprocable within the bore of said cylinder such that a transverse end face of the piston extends a distance out from the open end of said cylinder bore when said piston is fully retracted into said bore, said piston having an annularly extending open end portion having an internal recess, said cylinder having a recess adjacent the open end of said bore enlarging the open end of said bore, said piston having an annular recess at the end portion thereof forming with the cylinder recess an enlarged common inset open at the cylinder open end, an annular bellows member of elastically deformable material resting within said inset, said bellows member having a plurality of folded bellows when said piston is fully retracted into said bore, an annular rigid reinforcing ring sealing and holding the outer periphery of the bellows member to the cylinder against a wall of said inset, an annular resilient cup shaped member permanently affixed to the bellows member at the inner periphery of the bellows member, said resilient member comprising three integrally connected ring sections, a first of said ring sections permanently affixed to an end section of said bellows member within the piston recess, said first ring having its length generally parallel to the axis of the cylinder bore, the second ring section overlying and contacting the transverse face of the piston, and the third ring section protruding into the open end recess of said piston to grip the annular protruding portion of the piston from the interior thereof, said bellows member including an inner region overlying the second ring of said resilient member with said inner region compressed between the second ring and a brake shoe, and said bellows member is disposed to stretch on sliding movement of said piston in the out of bore direction and cover said interface.

4,537,290

SLIDING CALIPER DISC BRAKE

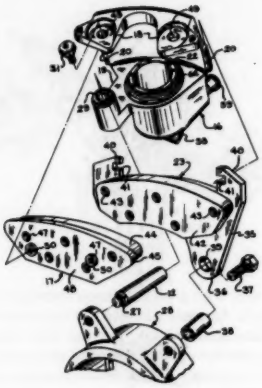
Anthony C. Evans, Northville, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Division of Ser. No. 099,392, Dec. 3, 1979, Pat. No. 4,391,355.

This application Nov. 4, 1982, Ser. No. 439,007

Int. Cl.³ F16D *65/06*

U.S. Cl. 188—73.31 **1 Claim**



1. In a vehicle disc brake having a generally C-shaped caliper extending across the periphery of a rotatable disc, an improved inboard brake pad comprising a back plate having inboard and outboard sides, a friction pad, means mounting said friction pad on said outboard side, said back plate defining first arm and second radially extending arms said arms having means for slidably engaging said caliper, and said back plate defining a third arm extending oppositely from said first and second arms said third arm having means for slidably engaging a mounting pin attached to the vehicle.

4,537,291

BRAKE SHOE ASSEMBLY INCLUDING BRAKE SHOE SPRING

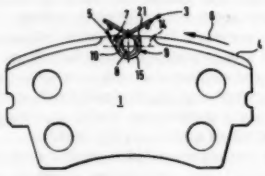
Rudolf Thiel, Frankfurt am Main; Helmut Weisbrod, Bad Nauheim, and Hermann Braehler, Darmstadt, all of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed May 9, 1983, Ser. No. 492,929

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1982, 3220632

Int. Cl.³ F16D *65/02*

U.S. Cl. 188—73.38 **17 Claims**



1. A brake shoe assembly for use in its mounted position as a component of a brake, comprising

a brake shoe including

a carrier plate extending along a plane and having two oppositely facing major surfaces along said plane, an edge surface facing outwardly in the mounted position, delimiting surfaces that bound in said carrier plate at the area of said edge surface a recess that opens onto said

edge surface, and a projection which extends into said recess substantially parallel to said plane, and

a friction material lining arranged at one of said major surfaces and affixed to said carrier plate; and

a spring including

a convoluted portion at least partially received in said recess of said carrier plate and having at least two convolutions situated across said projection from one another to confine said projection between themselves, and an interconnecting section connecting said convolutions with one another and situated at the region of said edge surface, and

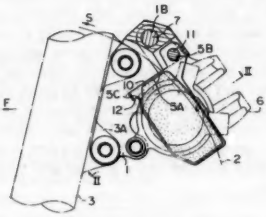
two legs each connected to one of said convolutions and extending therefrom outside said recess and outwardly of said edge surface as considered in the mounted position.

4,537,292

FRICTION PAD ASSEMBLY FOR A DISC BRAKE

Koichi Tamura, Tokyo, Japan, assignor to Tokico Ltd., Kawasaki, Japan

Continuation of Ser. No. 293,089, Aug. 17, 1981, abandoned.
This application Jan. 5, 1984, Ser. No. 568,528
Claims priority, application Japan, Aug. 20, 1980, 55-114148
Int. Cl.³ F16D *55/224, 65/02*
U.S. Cl. 188—73.39 **3 Claims**



1. A brake pad assembly comprising:

a brake disc;

two brake pads located on opposite sides of the brake disc, each brake pad including a backing plate with friction material secured thereto, each said backing plate having a radial inner side, a radial outer side and opposing peripheral sides;

a stationary brake support;

a brake caliper mounted on said brake support, said brake caliper straddling said brake disc and engaging said brake pads;

first locating means spaced radially outwardly from the periphery of the brake disc for slidingly engaging said backing plates with said brake support, said backing plates being slidable in a direction parallel to the center axis of the brake disc, said first locating means locating one of said opposing peripheral sides of the backing plates with respect to the brake support;

second locating means spaced radially inwardly from the periphery of the brake disc, said second locating means locating said one peripheral side of the backing plates with respect to the brake support, said second locating means including a projection defined by each of the backing plates, each said projection extending radially inwardly towards the center of the brake disc, and

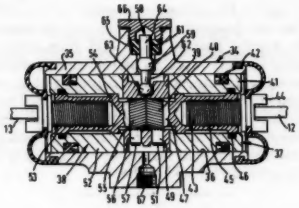
a recess defined by the brake support being shaped complementary to each said projection for guiding the sliding movement of each said projection in the direction parallel to the center axis of the brake disc, said recess including a first abutment surface and a second abutment surface opposite one another abutting each said projection so that each of the backing plates is supported along said one peripheral side on said brake support projecting in a cantilever style toward the other peripheral side from the brake support and each of said backing plates is slidingly anchored at the first locating means and the second locating means, the effective area of the second abutment surface being substantially smaller than the effective area of the first abutment surface, said first abutment surface receiving the braking torque from the brake pads in the normal rotational direction of said brake disc and said second abutment surface receiving the braking torque from the brake pads in the reverse rotational direction of said brake disc.

4,537,293

HYDRAULIC CYLINDER ASSEMBLIES

Duncan W. Osborne, Leamington Spa, England, assignor to Automotive Products plc, Leamington Spa, England

Continuation of Ser. No. 326,040, Nov. 30, 1981, abandoned.
This application Mar. 29, 1984, Ser. No. 594,431
Claims priority, application United Kingdom, Dec. 9, 1980, 8039439
Int. Cl.³ F16D *65/56*
U.S. Cl. 188—196 BA **7 Claims**



1. In an internal shoe drum brake comprising a pair of brake shoes arranged for outward movement against a brake drum and a mechanical expander arranged between one pair of adjacent ends of the shoes, a hydraulic wheel cylinder assembly arranged between the other pair of adjacent ends of the shoes, said wheel cylinder assembly comprising:

a cylinder body having a through bore therein;

a pair of piston assemblies slidable in said bore each of said piston assemblies having a respective variable length adjustable tappet assembly which comprises a rotatable screw-threaded component interengaged with a non-rotatable screw-threaded component;

means on each of said tappet assemblies for transmitting a thrust to an adjacent brake shoe;

an inlet port in the cylinder body opening into said bore for supplying hydraulic pressure to urge the piston assemblies apart;

an abutment member axially slidable in the same through bore as the said piston assemblies in either direction away from a centered position so as to enable both piston assemblies to move together so that the drag load from the trailing end of one brake shoe applied to the adjacent piston assembly is transmitted through the abutment member onto the other piston assembly and onto the leading end of the other brake shoe;

a spring centering device acting on the abutment member resiliently to bias the abutment member into said centered position in the bore after moving together with said piston in either direction away from the centered position,

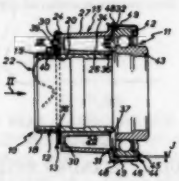
said spring centering device comprising a lever which is pivotable on the cylinder body and on the abutment member.

4,537,294

CLUTCH RELEASE BEARING WITH SPACER MEMBER

Pierre Renaud, Le Plessis-Trevise, France, assignor to VALEO, Paris, France

Filed Feb. 4, 1983, Ser. No. 463,849
Claims priority, application France, Feb. 5, 1982, 82 01870
Int. Cl.³ F16D 23/14; F16C 19/10
U.S. Cl. 192—98 14 Claims



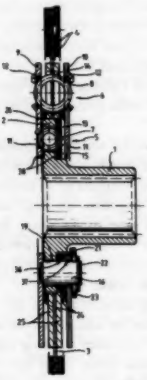
1. A clutch release bearing for an automotive clutch having a clutch release mechanism, said clutch release bearing comprising an operating member adapted to be controlled by an actuating member, a drive member attached axially to said operating member and being responsive to the said operating member for coacting with the clutch release mechanism, said operating member having an axial sleeve adapted to be received on a guide member and a transverse flange adapted to bear axially against the actuating member on one side and said drive member on the opposite side, said drive member being substantially axially spaced from said transverse flange, a spacer member slidably received on said sleeve and interposed axially between said flange and said drive member, said spacer member maintaining said drive member in axially spaced relationship relative to said transverse flange; the improvement wherein resilient detent means are operably disposed between said spacer member and said sleeve for fixing said spacer member axially in position on said sleeve.

4,537,295

CLUTCH DISC ASSEMBLY WITH TORSIONAL OSCILLATION DAMPERS

Kurt Fädler, Niederwerrn, and Friedrich Kittel, Schweinfurt, both of Fed. Rep. of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Nov. 2, 1982, Ser. No. 438,482
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1981, 3145312
Int. Cl.³ F16D 3/14, 3/66, 13/64
U.S. Cl. 192—106.2 25 Claims



1. A clutch disc assembly for a motor vehicle comprising: a hub having a radially projecting annular flange affixed thereto; annular friction pad means coaxially arranged with said hub for torque transmission therebetween; annular plate means comprising a pair of annular plate members arranged on axially opposite sides of both said friction pad means and said annular flange; annular disc means comprising an annular disc member axially adjacent said annular flange and arranged between said annular flange and one of said annular plate members; said annular plate means and said annular disc means being rotatably mounted relative to said hub; coupling means rotatively connecting together said annular plate means and said annular disc means, said coupling means being arranged in rotative driving engagement with said hub with angular play being provided therebetween; load damper means operatively interposed between said annular friction pad means and said annular plate means; idler damper means operatively interposed between said annular flange and said annular disc means; said idler damper means being located radially inwardly of said load damper means within openings formed in said annular flange with at least one of said annular plate members extending radially alongside said idler damper means; and indentation means formed in said annular plate means and in said annular disc means for holding said idler damper means within said openings of said annular flange; wherein said coupling means are fastened on one of said annular plate members, wherein the other of said annular plate members and said disc member are guided to be nonrotatable but axially displaceable relative to said coupling means, wherein said coupling means are provided with support elements on an axially remote side of said one plate member, wherein compression springs are provided in engagement between said support elements and said other plate member and said disc member to produce damping frictional forces; and wherein said compression springs comprise twin-armed spring elements held on said coupling means, said twin-armed spring elements including a first arm supported on said other plate member and a second arm supported on said disc member.

4,537,296

CLUTCH DRIVEN PLATE ASSEMBLY

Thaddeus Lech, Jr., Farmington Hills, and Richard T. Popchock, Lake Orion, both of Mich., assignors to Alma Piston Company, Southfield, Mich.

Filed Jul. 23, 1984, Ser. No. 633,715
Int. Cl.³ F16D 13/68
U.S. Cl. 192—106.2 27 Claims

1. A clutch driven plate assembly comprising a hub assembly connectable to a driven shaft;

a driven plate having a peripheral friction facing rotatably mounted upon said hub assembly;

a spring retainer plate rotatably mounted upon said hub assembly and spaced from and secured to said driven plate and rotatable therewith;

said hub assembly including an inner hub and an outer hub having a driven flange;

said inner hub having a splined bore and a pair of outwardly directed converging radial flanges;

said outer hub flange being interposed between said driven plate and said spring retainer plate and having a central opening of the same shape and oversized with respect to and loosely receiving said inner hub flanges for limited rotation thereof relative to said inner hub flanges;

a centrally apertured back plate upon the interior of and bearing against said spring retainer plate and spaced from said inner and outer hubs and secured to said outer hub flange;

a resilient apertured disc spacer interposed between and bearing against said inner and outer hubs and back plate and bearing against said inner hub flanges and outer hub flange on one side of said inner hub;

axial spring means interposed in compression between said inner hub flanges and said back plate normally biasing said inner hub flanges away from said back plate;

a resilient washer mounted upon said inner hub bearing against the other side of said inner hub flanges and retained between said inner hub and said driven plate;

there being a plurality of circumferentially spaced axially aligned windows in said plates and outer hub flange;

and at least one compression spring nested and retained within each set of laterally aligned windows defining a yieldable connection between said driven plate and outer hub flange;

said springs dampening relative rotary motions between said plates and said outer hub flange;

said spring means, spacer disc and washer further dampening relative rotary motions betwen said inner and outer hubs.

4,537,297

FRICTION CLUTCH DRIVEN PLATE

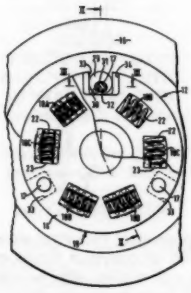
David A. Davies, Leamington Spa, England, assignor to Automotive Products plc, Leamington Spa, England

Filed Jan. 11, 1983, Ser. No. 457,143

Claims priority, application United Kingdom, Jan. 13, 1982, 8200965

Int. Cl.³ F16D 3/66

U.S. Cl. 192—106.2 **9 Claims**



1. A friction clutch driven plate comprising:

a hub;

a hub flange fast with the hub;

a friction facing carrier assembly mounted for limited rotation relative to the hub, said carrier assembly including at least one flange;

friction damper means for damping said relative rotation and includng an intermediate plate located for friction engagement with the hub and having an aperture therein;

spring windows in the carrier assembly flange and the hub flange;

damping springs in the spring windows for controlling rotation of said carrier assembly relative to the hub;

a pivot pin mounted on the carrier assembly;

and a centrifugal force responsive pendulum device comprising a collar having a cylindrical outer periphery and an eccentric pivot hole by which the pendulum device is pivotable on said pivot pin;

the outer periphery of the pendulum device cooperating with the aperture in the intermediate plate to vary the operation of said friction means in response to variations in the rotational speed of the driven plate whereby the friction damping at higher speeds is increased compared with that at lower speeds.

4,537,298

TORSIONAL DAMPERS

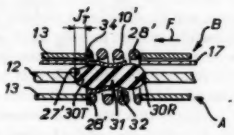
Pierre Loizeau, Ville d'Avray, France, assignor to Valeo, Paris, France

Filed Feb. 8, 1983, Ser. No. 464,933

Claims priority, application France, Feb. 9, 1982, 82 02033

Int. Cl.³ F16D 3/66, 3/68

U.S. Cl. 192—106.2 **12 Claims**



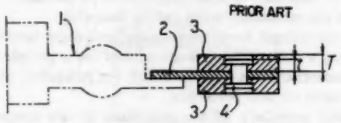
1. A multi-stage torsional damper comprising at least two coaxial parts mounted so as to be rotatable relative to one another within pre-determined limits of relative angular movement, first and second torsional damping stages operatively disposed between said coaxial parts, said second stage torsional damping means comprising a plurality of helical springs extending in a substantially tangential direction relative to a circumference of the damper and disposed between said coaxial parts in the circumferential direction, each of said springs being partially housed, without circumferential clearance in a rest configuration of the damper, in an opening formed for this purpose in a first of said coaxial parts, and partially housed with circumferential clearance in said rest configuration, in an opening formed for this purpose in a second of said coaxial parts, said first stage torsional damping means comprising a peg of elastic material arranged inside at least one of said helical springs and housed in an associated opening in said second coaxial part and a bush coaxial with said spring accommodating said peg and being circumferentially slidable relative thereto; and constricting means disposed between said elastic material peg and said bush to impede movement of said peg within said bush and to return said peg to a substantially central rest position after such movement, said bush being held in engagement with said first coaxial part during an initial range of relative angular displacement of said coaxial parts while being slidable relative to said peg to effect first stage damping.

4,537,299

FACING ASSEMBLY OF A FRICTION CLUTCH DISC

Yasunobu Fukatani, Hirakata, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Jun. 29, 1982, Ser. No. 393,402
Claims priority, application Japan, Jun. 30, 1981, 56-98240[U]
Int. Cl.³ F16D *69/04*
U.S. Cl. 192—107 C **2 Claims**



1. A facing assembly of a friction clutch disc, comprising:
a facing fixing plate having plural apertures arranged at radially outer portions and radial inner portions;
a pair of facings disposed on both faces of the fixing plate, said facings integrally connecting each other by connection portions extending through said plural apertures such that said facings are fixed to said fixing plate, and wherein a total sectional area of connecting portions in radially outer portions of the facings is larger than a total sectional area of connecting portions in radially inner portions of the facings, and wherein the facings and the plate portion to which the facings are fixed are divided into plural portions by substantially radial slits, and the adjacent two facings portions with each slit therebetween are axially shifted with respect to each other with a slight axial distance therebetween so that the plate portions pressed to a flywheel by a pressure plate may be elastically deformed to reduce the axial distance to zero; and
grooves formed in each facing portion running from the radial inner portion to the radial outer portion of each facing portion, said grooves being inclined with respect to the radial direction and the radially inner and end of each of said grooves occupying a forward position with respect to the clutch rotating direction wherein said grooves on opposing sides of said fixing plate alternate with respect to the clutch rotating direction, and wherein the greater distance from a leading edge of the facings, with respect to the clutch rotating direction, to the first groove of each facing portion from said leading edge is located on the side nearest an engaging pressure plate compared with the opposing side nearest an engaging flywheel.

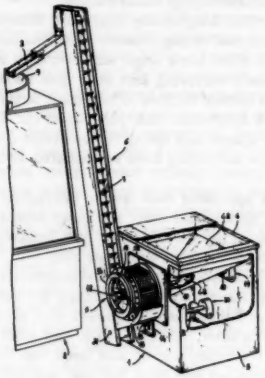
4,537,300

APPARATUS FOR SELECTING AND SUPPLYING CAPSULES OR LIKE ROUND ARTICLES OF DEFORMABLE MATERIAL TO THE FEED HOPPER OF MACHINES FOR HANDLING THESE ARTICLES

Libero Facchini, Bologna, Italy, assignor to Farmatic S.r.l., Ozzano Emilia, Italy

Filed Apr. 15, 1983, Ser. No. 485,169
Claims priority, application Italy, May 3, 1982, 3411 A/82
Int. Cl.³ B65G *47/12*
U.S. Cl. 198—453 **4 Claims**

1. An apparatus for selecting and supplying elongate round articles of a deformable material to a device for handling said articles comprising:
a support base;
a hopper mounted on said base for receiving a supply of said articles;
a hollow drum rotatable about a horizontal axis mounted on said base, said drum having a peripheral shell formed by a plurality of planar segments pivotally mounted between an endwall and an end ring of said drum for providing access to the interior thereof for the removal of unselected damaged articles, said end ring being disposed adjacent said hopper for the communication therewith of the interior of said drum;
a plurality of openings formed in each of said segments perpendicular thereto and arranged in axial rows lying in a staggered relationship with one another, the inner ends of said openings tapering outwardly;
an upright flight conveyor disposed tangentially to said drum and provided at the upper end thereof with a chute for discharge into said device for handling said articles;
a trough provided beneath said drum extending along a portion of the periphery thereof for collecting the articles passed through said openings and feeding same into said conveyor; and
means for driving said drum and said conveyor in the same direction.

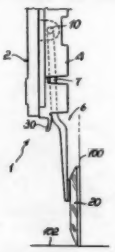


4,537,301

PRESSURE SHOE FOR GLASS PROCESSING APPARATUS

Franco Bavelloni, Appiano Gentile, Italy, assignor to Z. Bavelloni S.p.A., Bregnano, Italy

Filed Apr. 25, 1983, Ser. No. 488,460
Int. Cl.³ B65G *15/14*
U.S. Cl. 198—626 **6 Claims**



1. A glass plate pressing or backingup shoe structure particularly for attachment on conveyor means of glass processing apparatus such as a glass plate edge bevelling machine comprising an elongate body having blocks on one face thereof, said blocks defining free engagement surfaces adapted for abutment engagement with a plate glass workpiece to be processed, and auxiliary supporting plate member, movably connected to said elongate body, said plate member being positionable in a first position, whereat said plate member forms a

supporting extension of said elongate body and in a second idle position, whereat said plate member is accommodated within said elongate body behind said engagement surfaces.

4,537,302

DEVIATING STATION FOR HANDLING ARRANGEMENT, AND HANDLING ARRANGEMENT PROVIDED THEREWITH

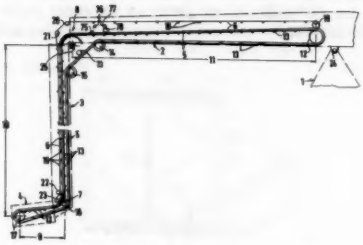
Arnold Gsponer, Oberuzwil, Switzerland; Werner Huber, and Milan Petrovic, both of Brunswick, Fed. Rep. of Germany, assignors to Bühler - Miag GmbH, Brunswick, Fed. Rep. of Germany

Filed Nov. 15, 1982, Ser. No. 441,799

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1981, 3145104

Int. Cl.³ B65G *15/14*

U.S. Cl. 198—626 **9 Claims**



1. A deviating station for a handling arrangement with a supporting frame and conveying means including a movable band conveyor element which has at least two conveyor portions and is closed by a movable cover band element, the deviating station comprising

a plurality of supporting rollers arranged on the supporting frame in groups so as to form a plurality of supporting points for the band conveyor element and the cover band element;

a shape-variable roller holder which is arranged to support the supporting rollers of at least some of the supporting points of at least one of the movable elements of the conveying means and follows the movement of the band conveyor element and the cover band element, said roller holder being formed as a link chain with two ends one of which is pivotally connected with the supporting frame; and

tensioning means connected with the other end of said link chain formed by said roller holder.

4,537,303

DEVICE AND METHOD FOR MIXING LIQUID AND POWDERY COMPONENTS, PARTICULARLY FOR DENTAL PURPOSES

Ernst Muhlbauer, Dorpfeldstieg 3, 2000 Hamburg 52, Fed. Rep. of Germany

Filed Dec. 2, 1983, Ser. No. 557,472

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1983, 3303838

Int. Cl.³ B65D *25/08*

U.S. Cl. 206—219 **16 Claims**

1. A method of mixing a dental amalgam in a vibration mixing chamber comprising the steps of:

providing a predetermined amount of liquid dental component tightly enclosed in a first rupturable foil pocket of sufficient strength to rupture and thereby release the said predetermined amount of liquid dental component from the said first pocket upon the action of a mixing vibration,

providing a predetermined amount of powdery dental component enclosed in a second rupturable foil pocket of sufficient strength to rupture and thereby release the said predetermined amount of powdery dental component from the said second pocket upon the action of a mixing vibration and comprised of a material having a specific gravity at least five times less than said powdery dental component, said predetermined amount of powdery dental component being coordinated to said predetermined amount of liquid dental component for forming a dental

amalgam of fixed predetermined proportions of said liquid dental component and said powdery dental component,

vibration mixing the first and second foil pockets in a vibration mixing chamber to rupture the foil pockets and admix the said predetermined amounts of the liquid and powdery dental components to form a dental amalgam of said fixed predetermined proportions of said liquid dental component and said powdery dental component.

4,537,304

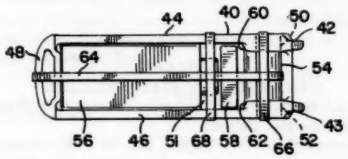
RAILWAY, COUPLER YOKE, DRAFT GEAR AND FOLLOWER ASSEMBLY

John W. Kaim, Chicago; Norman A. Berg, Wheaton, both of Ill., and Russell G. Altherr, Munster, Ind., assignors to AMSTED Industries Incorporated, Chicago, Ill.

Filed Jan. 17, 1983, Ser. No. 458,205

Int. Cl.³ B65D *85/68*; B65B *13/02*

U.S. Cl. 206—335 **5 Claims**



1. A pre-assembled railway car yoke, follower and draft gear assembly comprising a coupler yoke having a head portion at one end thereof with an opening therein and two elongated strap portions extending from said head portion to a rear portion joining said two strap portions to form a central pocket with two open sides in said yoke,

a partly compressed draft gear means in said central pocket of said yoke between said two strap portions, said draft gear means comprising a housing having top, bottom and side walls and a cushioning means located within said housing,

a follower between said draft gear means and said yoke head portion in said central pocket of said yoke, and a band means extending in line with the longitudinal axis of said yoke to hold said draft gear and said follower in said central pocket of said yoke, said band means extending around the outside of said rear portion of said yoke, across the said two open sides and around the draft gear, the follower and into the yoke head portion so as to maintain the draft gear and the follower in the central pocket of the yoke prior to assembly within a railway car.

4,537,305

PACKAGE FOR STORAGE OF MEDICAL CONTAINER

Nobuyasu Takanashi, Fujinomiya, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 426,216, Sep. 28, 1982, abandoned. This application Nov. 9, 1984, Ser. No. 670,660

Claims priority, application Japan, May 6, 1982, 57-74502

Int. Cl.³ B65D *81/20*

U.S. Cl. 206—438 **16 Claims**

1. A package containing (i) a plastic medical container and (ii) a deoxidizer, said medical container containing a medicinal fluid which will degrade when contacted with oxygen gas and said container being made of a material which is pervious to gases and steam, said package comprising:

a tray part having an opening and comprising a laminated structure including an outer polypropylene layer, an intermediate layer capable of barriering passage of gases and steam and and inner polyolefin layer, and a flange portion around said opening;

a lid member having a laminated structure including an inner polyamide layer, an intermediate layer capable of barriering passage of gases and steam and an outer layer of a resin having a thermal resistance sufficient to withstand the condition of heat sealing;

said intermediate layers being substantially impervious to steam so that the steam which permeates from the medical container is retained within the package whereby the atmosphere in the package may be saturated with said steam; and

a hotmelt adhesive layer formed of a blend of polyethylene and polypropylene, said hotmelt adhesive layer being inserted between said flange portion of said tray part and said lid member, said flange portion and said lid member being peel openably heat sealed to each other in a said hotmelt adhesive layer.

4,537,306

RADIOGRAPHIC FILM PACKAGE

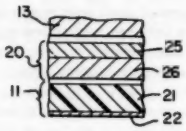
Wilfried E. Muylle, Schoten, Belgium, assignor to AGFA-Gevaert N.V., Mortsel, Belgium

Continuation of Ser. No. 428,807, Sep. 30, 1982, abandoned, which is a continuation of Ser. No. 246,107, Mar. 20, 1981, abandoned. This application Jul. 3, 1984, Ser. No. 626,483

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1980, 8008205[U]

Int. Cl.³ B65D *85/48*

U.S. Cl. 206—455 **7 Claims**



1. In a flat, air-tight, evacuated radiographic film package for non-destructive testing which comprises: a radiographic film sheet, a foil sheet comprising a layer of lead in contact with at least one side of the film sheet, and a light-opaque laminated wrapper extending over both sides of said film sheet and foil sheet with said film and foil sheets sandwiched therebetween, said laminated wrapper comprising an inner layer of a heat-sealable peel-strippable thermoplastic, and an outer protective layer of a generally transparent polymer, with the two sides of said wrapper being air-tightly sealed around the open edges thereof by heat-sealing together the mutually facing inner thermoplastic layers in the margins of said wrapper sides proximate said edges while the interior of said wrapper is under vacuum, the improvement wherein said laminated wrapper includes an intermediate layer of aluminum vacuum deposited upon the inner face of said outer protective layer.

4,537,307

DAYLIGHT FILM LOADING METHOD AND APPARATUS, FILM AND FILM PACKAGE USED FOR SAME

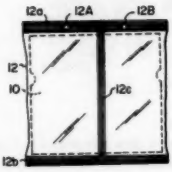
Kaoru Tamura, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Filed Aug. 15, 1983, Ser. No. 523,319

Claims priority, application Japan, Aug. 16, 1982, 57-141976; Aug. 16, 1982, 57-141977; Aug. 16, 1982, 57-141978

Int. Cl.³ B65D *85/62, 85/30, 85/48;* G03B *19/10*

U.S. Cl. 206—455 **24 Claims**



11. A film package for loading in a daylight environment comprising:

(i) an unexposed rectangular light-sensitive film sheet provided with at least one clamp notch at each side edge, or a sheet stack of a plurality of such film sheets laid one upon another by aligning the corresponding notch positions with one another,

(ii) a protective sheet for protecting said film sheet or said sheet stack by covering at least one surface of said film sheet or said sheet stack, which has higher rigidity than the rigidity of said film sheet and has a size at least equal to the size of said film sheet, and which is provided with clamp notches at least at the portions overlapping said clamp notches when laid on said film sheet or said sheet stack, and

(iii) a flexible lighttight packaging material containing said film sheet or said sheet stack protected by said protective sheet in lighttight condition,

(iv) said film package being adapted for hanging said film sheet or said sheet stack by engagement of said notches of said sheet or said sheet stack and said protective sheet with clamp members from outside said packaging material.

4,537,308

RUPTURABLE PACKAGES

Edward F. Hollander, Jr., Broomall, Pa., assignor to John P. Glass, Essington, Pa.

Division of Ser. No. 938,774, Sep. 1, 1978, Pat. No. 4,227,614, which is a division of Ser. No. 720,084, Sep. 2, 1976, abandoned. This application Feb. 8, 1980, Ser. No. 119,863

Int. Cl.³ B65D *77/12*

U.S. Cl. 206—484 **4 Claims**

1. A package comprising a cylindrical tube of flexible material, a first end of said tube being closed by a first ultrasonic seal extending transversely across the tube, a second end of said tube being closed by a second ultrasonic seal extending transversely across the tube, said tube providing an internal chamber between said seals for containing a product and said second seal having a portion narrower than any portion of the first seal for rupturing under pressure for the dispensing of the product

only through said second end of the tube, and a tab extending beyond one of said seals, said tab consisting of an open exten-

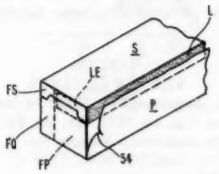
sion of said tube, and a plurality of notches formed in the open edge of said extension providing a code to identify the contents of the package.

4,537,309

TAMPER RESISTANT AND TAMPER EVIDENT SEALED END CARTONS

Nancy B. Boorsma, Penfield, N.Y., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Sep. 16, 1983, Ser. No. 532,861
Claims priority, application Japan, Sep. 10, 1982, 57-137569
Int. Cl.³ B65D *5/42, 77/22, 55/02*
U.S. Cl. 206—525 **12 Claims**



1. In a product including

secondary packaging means comprising a carton wherein one of four wall panels is provided with a glue lap for gluing to an interior surface of another of said four wall panels to form a rectangularly shaped carton having a glue lap seam, said carton including a pair of opposed dust flaps foldable and folded toward each other and provided at ends of a pair of opposing wall panels, a first closure flap provided at each end of another of said four wall panels for folding over said folded dust flaps, a second closure flap extending from each end of remaining of said four wall panels for overlapping said first closure flaps and glued thereto, and

primary packaging means contained within said carton, said primary packaging means containing a consumable product therein, in combination, the improvement comprising

an extension provided at each end of said glue lap, each of said extensions glued to a respective dust flap extending from said panel to which said glue lap is glued, said extensions foldable with said dust flaps,

said carton providing tamper resistance to intrusion thereinto via said glue lap seam and visual evidence of said tampering upon physical separation of said glue lap from said wall panel carrying said dust flaps with said glue lap extensions.

4,537,310

TEAR-OFF PAD RAIL CLIP

James L. Thul, Plymouth, Minn., assignor to The Press, Inc., Chanhassen, Minn.

Filed May 23, 1984, Ser. No. 613,959
Int. Cl.³ B65D *85/00;* **G09F** *1/00*
U.S. Cl. 206—526 **15 Claims**

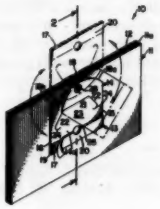
1. A tear off pad and rail clip assembly comprising:

(a) a plurality of individual sheets each having a top edge, said sheets cooperatively connected at said top edge to form a pad having a top edge;

(b) a mounting plate of a flexible, resilient material, said mounting plate having a mounting hole formed therein, whereby when said mounting plate is rotated to an up position, said assembly may be supported from a hook positioned through said mounting hole;

(c) a strip of pressure sensitive adhesive cooperatively connected to said mounting plate and a release paper covering said adhesive;

(d) means for forming a tongue section in said mounting plate;



(e) means for pivotally mounting said plate to said pad, said plate being rotatable between a down position and an up position, wherein when in the up position, said mounting hole, tongue section and adhesive are all positioned above said pivotally mounting means; and

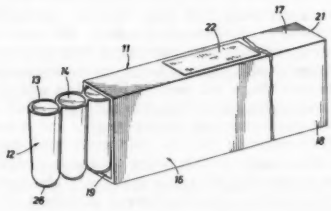
(f) said plate, when in said down position, having a top side having an apex positioned generally above said pivot means and said top side having generally downwardly depending segments, wherein said plate is rotatable to an intermediate position between said up and down positions, wherein said top side of said plate is below said top edge of said pad when in said intermediate position.

4,537,311

SEAMLESS SUPPOSITORY DISPENSER

William R. Wilkinson, Houston, Tex., and Russell G. Sharp, 707 Santa Maria, Sugarland, Tex. 77478, assignors to Russell G. Sharp, Sugarland, Tex.

Filed Jun. 27, 1983, Ser. No. 507,965
Int. Cl.³ B65D *83/04*
U.S. Cl. 206—529 **6 Claims**



1. A combination mold and a carrier for suppositories, comprising:

(a) an elongated rectangular body of flexible material that is dimensionally stable at ordinary temperatures;

(b) said body having a width substantially less in dimension than in height, and a length substantially greater than both its width and height;

(c) said body having parallel planar top and bottom surfaces, and tapered side surfaces that merge together adjacent said top surface and separate into individual tubular members as they extends towards said bottom surfaces;

(d) a plurality of tapered cavities formed side-by-side within said body and said cavities uniformly spaced laterally along said top surface and extending axially in a uniform constant taper within each tubular member through said body towards said bottom surface;

(e) said cavities each having rounded walls defining a rounded bottom of said cavities to facilitate suppository ejection from each cavity by a manual pinching action upon said rounded walls and said tubular members, said rounded bottom beginning in curvature at a predetermined dimension above said bottom surface of said body whereby said volumetric capacity of each cavity can be adjusted;

(f) said rounded walls at their apex carrying flat supporting bases in parallel to said top surface to receive a suppository mixture downwardly into said cavities: and

(g) said rounded walls connected by tubular walls to said top surface and said tubular walls about said cavities forming a common wall of uniform thickness between said cavities in said body.

4,537,312

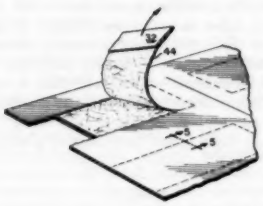
CHILD-RESISTANT TAMPER-EVIDENT PACKAGE

Thomas D. Intini, 9720 Recollet St., Brossard, Quebec, Canada J4X 1B9

Continuation-in-part of Ser. No. 495,993, May 19, 1983, abandoned. This application May 23, 1984, Ser. No. 613,334

Int. Cl.³ B65D *83/04*

U.S. Cl. 206—531 **4 Claims**



1. A child-resistant tamper evident package comprising an outer front layer and an outer back layer, an intermediate laminate between the outer front layer and outer back layer, said intermediate laminate including a blister layer having at least one capsule-receiving pocket formed therein, a rupturable film adhered to the blister layer with the film overlying said pocket, at least one aperture formed in said laminate, said front and back layers being sized larger than the intermediate laminate to thereby envelope the laminate, the front and back layers being sealed to each other about their periphery and to the aperture in said laminate, said outer back layer also being sealed to said film, a tab member formed in said outer front layer, a removable panel formed in said outer back layer, the removable panel overlying the tab member and at least one of the capsule-receiving pockets, said outer back layer being formed of a material which, when a force is applied thereto, sufficient to remove the removable panel, the material will delaminate to leave a portion thereof adhering to the film to thereby reinforce said film.

4,537,313

FLEXIBLE INSULATED CONTAINER

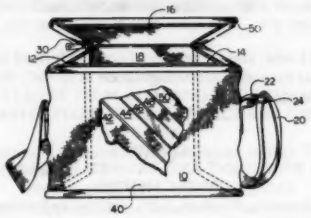
Eleanor Workman, 545 Ridge Ave., Elk Grove Village, Ill. 60007

Filed Feb. 27, 1984, Ser. No. 583,722

Int. Cl.³ H45C *11/20*; **F25D** *3/08*; **B65D** *81/18*

U.S. Cl. 206—545 **8 Claims**

1. An insulated container comprising a bottom panel, a front panel, a back panel and opposed side panels, said front, back and side panels being secured to said bottom panel along marginal edges thereof and being selectively secured to each other so as to lie generally normal to said bottom panel and define therewith a pouch, and a top panel hingedly attached to one of said side panels in a manner to enable selective movement between a closed position closing said pouch and an open position providing access to said pouch, said bottom, front, rear, side and top panels each including an outer exposed



durable layer of nylon and an inner layer of metalized mylar, and a composite insulation layer between said outer and inner layers comprising a layer of needle punched dacron, a layer of aluminum foil, a layer of dacron and a layer of thermal suede, said composite insulation layers being of substantially equal planar size to the corresponding inner and outer layers.

4,537,314

VORTEX CLEANER

Karl A. Skardal, Bergstigen 21A, S-182 74 Stocksund, Sweden

Filed Aug. 16, 1983, Ser. No. 523,782

Claims priority, application Sweden, Sep. 2, 1982, 8205011

Int. Cl.³ B04C *5/16*

U.S. Cl. 209—211 **12 Claims**

1. A vortex cleaner for separating a fibre-liquid suspension into a first fraction and a second relatively lighter fraction, comprising

an elongated vortex chamber having a circular cross-section and tapering toward its one end over at least part of its length,

a substantially tangentially directed inlet for the suspension to be treated at the wider end of said chamber,

an axially directed, first outlet for said second relatively lighter fraction at the wider end of said chamber,

a second outlet for said first relatively heavier fraction at the narrower end of said chamber, and

within the narrowing part of said chamber a plurality of shelf-like vanes attached to the inner wall surface of the chamber so as to project substantially radially into the chamber from the chamber wall and extending in an oblique direction relative to the axial direction of the chamber substantially coinciding with the flow direction of a helical vortex flow formed close to the chamber wall

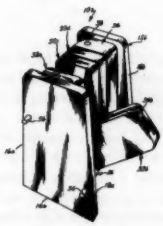
by a suspension being fed into the chamber through said tangential inlet, said vanes being mutually spaced apart in a manner such that the upstream end, as related to the flow direction of said helical vortex flow, of a given vane is located downstream, as related to the flow direction of said helical vortex flow, of the downstream end of the immediately preceding vane, as related to the flow direction of said helical vortex flow, and is substantially spaced in a peripheral direction and an axial direction from said downstream end of said immediately preceding vane.

4,537,315

KNIFE AND/OR STEEL STORAGE UNIT

Michael E. Griffin, Grand Rapids, Mich., assignor to F & M Trading Company, Howard City, Mich.

Filed May 3, 1984, Ser. No. 606,475
Int. Cl.³ A47F *7/00*
U.S. Cl. 211—70.6 **10 Claims**



1. A knife and/or steel storage unit, comprising:

spaced end panels, each having forward and rear surfaces, a lower surface adapted to rest on a countertop or the like;

an axle member extending between and connected to said end panels;

a series of knife receiving and retaining blocks pivotally mounted on said axle member, each of said blocks having a knife-receiving slot opening upwardly of said block and extending longitudinally along said block so as to open to one side thereof, said slots extending from said upward opening downward a sufficient distance to receive and encase the entirety of a knife-blade therein, and each block having at least one closure element secured thereto located adjacent said one side to block access to said slot from said one side and thereby retain a knife received therein;

said blocks pivotally mounted on said axle member so as to pivot forwardly from a storage position at which the slot and any knife contained therein are generally vertical with the handle uppermost to an access position at which the slot and any knife contained therein are at an angle with respect to the vertical permitting withdrawal of the knife from the slot without interference from an overhead obstruction, such as the bottom of a cupboard;

first means for retaining each of said blocks in said storage position, said first retaining means spanning the space between and interconnected to said end panels, the rear surfaces of any given block abutting said first retaining means when the block is in the storage position, and said first retaining means being located relative to said axle member such that the center of gravity of said block is not forward of said axle member when said block is in a storage position; and

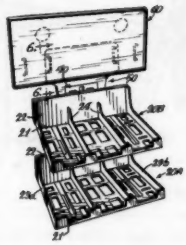
second means for retaining each of said blocks in said access position, said second retaining means spanning the space between and interconnected to said end panels, the forward surfaces of any given block abutting said second retaining means when the block is in the access position, and said second retaining means being located relative to said axle member such that the center of gravity of said storage unit lies rearwardly from the forwardmost points of said panel lower surfaces.

4,537,316

MODULAR DISPLAY FOR CIGARETTE PACKS

Virgil S. Simon, Glenview; Marvin L. Adenau, Hoffman Estates, and John S. Skalski, Hanover Park, all of Ill., assignors to Thomas A. Schutz Co., Inc., Morton Grove, Ill.

Filed Jul. 1, 1983, Ser. No. 510,436
Int. Cl.³ A47F *3/14*
U.S. Cl. 211—133 **22 Claims**



1. A modular retail counter display apparatus for merchandise which is displayed and sold in small packages, said apparatus comprising, in combination:

a single column which has a front wall provided with transversely adjacent vertical rows of aligned openings which are spaced apart by a predetermined distance;

and a pair of trays, each of said trays having a rear wall, four integral, coplanar, downwardly open hooks extending rearwardly from each rear wall, a central pair of said hooks being spaced apart by said predetermined distance so they may hook into two aligned column openings, and there being a flanking hook adjacent each end of each rear wall and spaced from the adjacent end toward the central pair of hooks by one-half said predetermined distance, and interfitting connectors at the ends of the pair of trays for fixedly joining the trays together with their ends abutting and the flanking hooks adjacent said abutting ends positioned to hook into two aligned single column openings, whereby said trays may be selectively connected to the column either in vertically spaced relationship or in end-abutting horizontal arrangement in which the two trays are supported only on said single column.

4,537,317

HEAVY DUTY TRAVEL CRANE

Lyle B. Jensen, Cedar Rapids, Iowa, assignor to FMC Corporation, Chicago, Ill.

Filed Apr. 23, 1984, Ser. No. 603,010
Int. Cl.³ B66C *23/72*
U.S. Cl. 212—189 **7 Claims**

1. A heavy duty mobile crane comprising:

means defining a steerable power driven main mobile unit supported by only two ground engaging propelling members which members remain parallel to each other at all times;

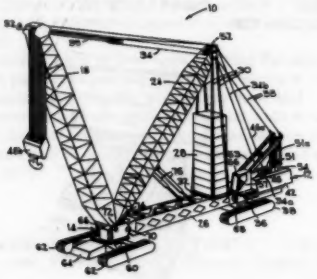
means defining a steerable independently power driven second mobile unit supported by only two second ground engaging propelling members which remain parallel to each other at all times;

a spreader link pivotally connected to said main and second mobile units for separating said units from each other a distance of at least one and one-half times the length of said ground engaging propelling members of said main unit when said propelling members are parallel to said spreader link;

a boom pivotally mounted on and supported by said second mobile unit and having an outer end;

a gantry pivotally mounted on and supported by said second mobile unit and having an outer end;

load engaging means including a load line trained over the outer ends of said boom and said gantry and adapted to be operatively connected to a load for lifting the load off the ground;



a counterweight supported on said spreader link between said mobile unit at a location adjacent said main mobile unit and operatively connected to and directly below the outer end of said gantry for counterbalancing said load;

boom positioning and hoisting means including a boom hoist line operatively connected to the upper ends of said boom and gantry and to the main control unit; and

control means for actuating said load lifting means for raising said load and for thereafter actuating said mobile units for carrying the load to a different location.

4,537,318

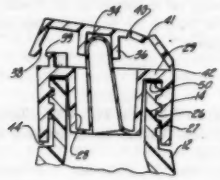
DISPENSING CLOSURE LOCK AND SEAL

Gary V. Montgomery, Evansville, Ind., assignor to Sunbeam Plastics Corp., Evansville, Ind.

Filed May 7, 1984, Ser. No. 607,640

Int. Cl.³ B65D *41/04*

U.S. Cl. 215—232 **10 Claims**



1. A dispensing package comprising: a container having a neck portion forming an opening with a lip around the edge of said opening and means for attaching a closure thereto, a closure for covering said opening having complementary means for attachment to said container, a metallic seal member disposed between said closure and said lip portion and having an annular portion engaged with said lip and with said closure when said closure has been initially applied to said container by engagement of said attachment means, said annular portion of said seal member having a coating on one side surface of a material fusible with said container and a coating on the other side surface of said seal member fusible with the material of said closure when said seal member is subjected to heat, said seal member being fused to said closure and said container to form a permanent connection therebetween.

4,537,319

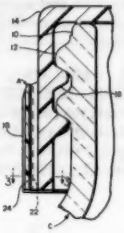
CONCENTRIC TAMPER-INDICATING BAND

Ralph H. Whitney, Whitehouse, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Nov. 19, 1984, Ser. No. 673,071

Int. Cl.³ B65D *41/34*

U.S. Cl. 215—252 **5 Claims**



1. A tamper-indicating cap and band assembly for use with a container with a neck having external screw threads comprising, a container cap having internal screw threads that mesh with the container neck external screw threads, and a coacting tamper-indicating ring band circumferentially encircling said cap and connected to the cap with a plurality of flexible frangible bridges and having a plurality of internal band projections disposed in peripheral spaced relation on the inner periphery of the band, said cap having a plurality of spaced cap projections disposed in peripheral spaced relation on the outer periphery of the cap and positioned thereon for coacting locking gear tooth type engagement with certain respective band projections on the band when the assembly is threaded onto the container and for locking gear tooth type engagement with other respective band projections when the assembly is unscrewed from the container, said cap and band projections being positioned to avoid fracturing the bridges when the cap and band are threaded onto the container in tightening rotation, and when the cap and band assembly is unscrewed from the container the frangible bridges will fracture before the cap will unscrew from the container thus separating the band from the container to indicate prior opening.

4,537,320

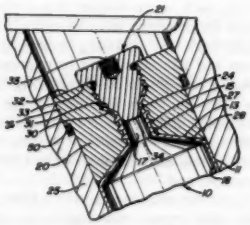
CENTRIFUGE TUBE HAVING REMOVABLE CROWN AND SWAGE FITTING

Steven T. Nielsen, 1126 W. Knickerbocker Dr., Sunnyvale, Calif. 94087

Filed Oct. 27, 1983, Ser. No. 546,010

Int. Cl.³ B65D *39/08*

U.S. Cl. 215—276 **15 Claims**



1. A centrifuge tube for repeated and reliable use in an ultracentrifuge, comprising:

a tube having an enclosed bottom portion, a body portion

and a partially enclosed upper end, said upper end terminating in a filler stem;

a support crown for fitting over said filler stem when said tube is placed in a rotor cavity within said ultracentrifuge; and

a swage plug for insertion into said support crown to cause a swaged seal to be formed between said filler stem and the internal surface of said support crown.

4,537,321
CATHODE-RAY TUBE

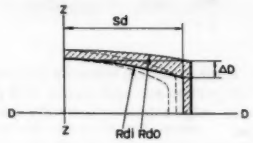
Kiyoshi Tokita, Fukaya, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 22, 1983, Ser. No. 564,197

Claims priority, application Japan, Mar. 9, 1983, 58-37439; Mar. 31, 1983, 58-53511

Int. Cl.³ H01J *61/30*

U.S. Cl. 220—2.1 A **11 Claims**



1. A cathode-ray tube (CRT) comprising:

a substantially funnel-shaped glass portion having a tube axis; and

a substantially rectangular faceplate, joined with said funnel-shaped portion to form the envelope of said CRT, said faceplate having curved inner and outer surfaces, a pair of long sides, a pair of short sides and four curved corners at which corresponding long and short sides meet, the dimensions of the faceplate being chosen so as to satisfy the relation

$$0.06 \leqq \frac{(Rd - \sqrt{(Rd)^2 - (Sd)^2})}{Sd} \leqq 0.12.$$

wherein

Rd is the radius of curvature of the inner surface in a plane including said tube axis and a diagonal connecting a pair of diagonally opposite corners among said four corners, and

Sd is one half of the diagonal dimension distance between a pair of diagonally opposite corners.

4,537,322
GLASS ENVELOPE FOR A CATHODE-RAY TUBE

Hisafumi Okada, Hyogo; Yoshio Suzuki, and Shigeo Takenaka, both of Fukaya, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 12, 1983, Ser. No. 560,105

Claims priority, application Japan, Dec. 13, 1982, 57-217098; Mar. 9, 1983, 58-37437

Int. Cl.³ H01J *61/30*

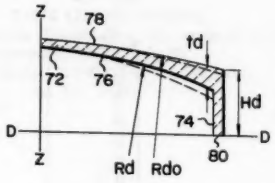
U.S. Cl. 220—2.1 A **8 Claims**

1. A glass envelope for a cathode-ray tube having a tube axis comprising:

a glass panel section including a faceplate and a skirt, said faceplate having two face surfaces on opposite sides of said faceplate, a substantially rectangular shape with long and short sides, a curved inner surface on one face surface thereof and a curved outer surface on the other face surface thereof, and said skirt extending from a peripheral portion of said faceplate along the tube axis,

said inner surface including a first inner surface radius of curvature Rsi set within a first plane including the tube axis and passing through center points of long sides of said faceplate, a second inner surface radius of curvature Rli set within a second plane including the tube axis and passing through center points of short sides of said faceplates and a third inner surface radius of curvature Rdi set within a third plane including the tube axis and a diagonal line connecting a pair of diagonally opposite corners of said faceplate,

said outer surface including a first outer surface radius of



curvature Rso set within said first plane, a second outer surface radius of curvature Rlo set within said second plane and a third outer surface radius of curvature Rdo set within said third plane, and

said inner and outer surface radii of curvature being defined by the following inequalities (1) and (2), respectively:

$$Rsi < Rli \text{ and } Rsi < Rdi \quad (1),$$

$$Rso < Rlo \text{ and } Rso < Rdo \quad (2).$$

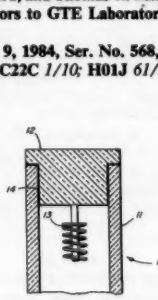
4,537,323
MO-TI MEMBERS WITH NON-METALLIC SINTERING AIDS

Brian M. Ditchek, Milford, and Thomas P. Middleton, Peabody, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Jan. 9, 1984, Ser. No. 568,995

Int. Cl.³ C22C *1/10*; H01J *61/36*

U.S. Cl. 220—2.1 R **28 Claims**



1. A member having an approximately uniform thermal expansion coefficient, said member sintered from a mixture comprised of molybdenum in the form of approximately −325 mesh powder, titanium in the form of approximately −325 mesh powder, and, as a sintering aid, 0.01 to 5 weight percent of oxygen in the form of oxide or boron or mixtures thereof.

23. A sealed assembly comprised of

a ceramic tube having two ends;

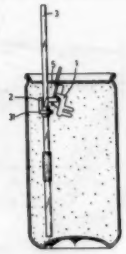
at least one member hermetically sealed to one of asid ends, said member a sintered composition of molybdenum in the form of approximately −325 mesh powder, titanium in the form of approximately −325 mesh powder, and approximately 0.01 to 5 weight percent of oxygen in the form of oxide, or boron, or mixtures thereof.

4,537,324

AUTOMATIC STRAW-EMERGING DEVICE FOR EASY-TO-OPEN BEVERAGE CAN OF PRESS-DOWN TYPE SEALING TAP

Ming-Sheng Wang, No. 6, 77 La., An Ho Rd., Taipei, Taiwan

Filed Nov. 6, 1984, Ser. No. 668,793
Int. Cl.³ A47G *19/22*
U.S. Cl. 220—90.2 **5 Claims**



1. A device to ensure a straw incorporated in an easy-to-open beverage can provided with top sealing tap, said straw being mounted in a manner that when said top sealing tap is opened, said straw can emerge a length from the opening sealed by said top sealing tap, said top sealing tap comprising a sealing portion which seals the opening of said can in an easy-to-open manner and a handle, said handle being disposed in a manner such that when a force is applied to the handle, said sealing portion can pivotally be moved into said can around an swinging axis to release the opening, yet still remain attaching to said can, characterized in that said device comprises a first part fixedly attaching beneath the sealing portion of said sealing tap sealing the opening of said can, and a second part pivotally mounted to said first part, allowing a pivotal movement of said top sealing tap and said first part relative to said second part around an axis;

said second part defining a first recess and a a second recess;

said second recess being structured to retain the upper part a straw;

said first recess being structured to allow the attaching portion with which said first part attaches to said sealing tap, of said first part, and said sealing portion of said sealing tap to pivotally pass through without touching said straw retained in said second recess;

said first and second parts being such that when said can is in sealed state, the top end of said straw is located in the vicinity of the opening of said can, and when said can is opened by pressing said top sealing tap to depress said first part, the top end of said straw is shifted to said opening.

4,537,325

STORAGE CONTAINER CLOSURE

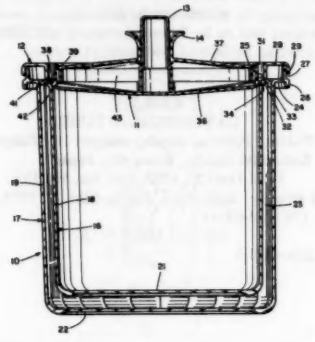
Mark P. Zieff, Lexington, Mass., assignor to Dart Industries Inc., Northbrook, Ill.

Continuation of Ser. No. 544,311, Oct. 21, 1983, abandoned. This application Aug. 29, 1984, Ser. No. 646,027
Int. Cl.³ B65D *53/00*
U.S. Cl. 220—234 **10 Claims**

1. In a closure for a container of the type having a generally circular throat opening and a closure member of the type comprising an elastically distortable seal member having a peripheral bead portion selectively contractable from a first bead diameter to a second, smaller bead diameter, said bead portion being releasably, sealingly engageable with the inner surface of said throat opening, the combination therewith comprising:

a first wall portion formed in said throat opening having a diameter greater than said first bead diameter;

a second wall portion formed in said throat opening below and adjacent said first wall portion having a diameter less than said first bead diameter and at least equal to said second bead diameter;



a first annular ledge extending inwardly and disposed between said first wall portion and said second wall portion; and

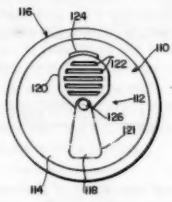
a second annular ledge extending inwardly below said second wall portion.

4,537,326

PROTECTOR FOR DRINK OPENING

Clyde D. Morehead, 4 Oak Meadow, Evansville, Ind. 47711

Filed Dec. 13, 1983, Ser. No. 560,844
Int. Cl.³ B65D *17/32, 17/34, 47/04*
U.S. Cl. 220—269 **10 Claims**



1. A protector for a drink opening in a liquid container comprising,

a removable closure for the opening in the container,

a flat cover having a plurality of small apertures therein and a peripheral portion surrounding the apertures,

mounting means comprising an adhesive located on said peripheral portion for mounting the cover to the container,

a releasable mounting area located on the container where the cover is initially mounted prior to removal of the closure whereby after removal of the closure the cover is removed from said mounting area and adhesively attached about the exterior periphery of the opening of the container so that dangerous insects and the like are prevented from entering the container through the drink opening by said cover but the liquid in the container is capable of passing through said cover.

3. A protector for a drink opening in a liquid container comprising,

a tab opening device including a tab actuator and a shearable closure which is displaced by the tab actuator to expose the can opening,

the tab actuator having a portion thereof including a flat cover having a plurality of samll apertures therein,

mounting means for mounting said cover to the container

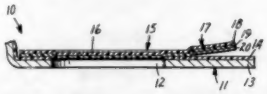
over the drink opening, said mounting means including a locking means for locking said flat cover in position over the opening whereby dangerous inserts and the like are prevented from entering the container through the drink opening by said cover but the liquid in the container is capable of passing through said cover.

4,537,327

TAPE CLOSURE FOR A CAN END

Shih-Lai Lu, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 13, 1984, Ser. No. 650,050
Int. Cl.³ B65D *41/00*
U.S. Cl. 220—359 **7 Claims**



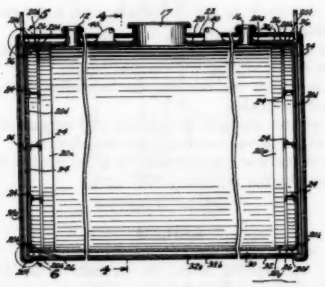
1. A container end assembly comprising
(a) a container end formed of metallic material having an exterior surface and an interior surface and being formed with a pour opening therein;
(b) a coating over at least the exterior surface of said container end, said coating comprising a carboxyl group-containing vinyl chloride/vinyl acetate copolymeric composition;
(c) a pressure sensitive tape bonded to an area of said exterior surface of said coating which is circumjacent and covers said pour opening, said pressure sensitive adhesive tape forming a bond to said coating which is greater than the bond between said coating and said container end, whereby upon peeling of said tape from said container end, said coating delaminates from said container end in the area of the pressure sensitive adhesive tape bond.

4,537,328

STORAGE TANK

Kenneth M. Keesee, Anaheim, and John R. Guyer, Riverside, both of Calif., assignors to Keesee Tank and Pump Co., Inc., Anaheim, Calif.

Filed May 14, 1984, Ser. No. 609,612
Int. Cl.³ B65D *87/24*
U.S. Cl. 220—445 **7 Claims**



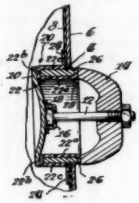
1. A storage tank comprising, in combination,
a primary tank adapted to be filled with fluid and having a coating of resinous material thereabout,
an outer tank surrounding said primary tank formed of relatively inert material,
and elongated spacers between said primary and outer tanks formed of plastic material and having a generally semi-circular cross-section providing a pair of spaced mounting edges,
said mounting edges of said spacers being embedded in said resinous material on said primary tank to locate and retain said spacers in proper position on said primary tank.

4,537,329

TANK LINING SYSTEM

William W. Norton, Lincolnshire, Ill., assignor to Culligan International Company, Northbrook, Ill.

Filed Apr. 2, 1984, Ser. No. 595,941
Int. Cl.³ B65D *25/14*
U.S. Cl. 220—465 **6 Claims**



1. A tank lining system which comprises:
a tank having a wall defining an opening;
a sheet lining adhering to the interior surface of said wall and defining an opening that is aligned with the opening defined by the tank wall;
a penetration fitting having a periphery that is similar in configuration to said opening and extending into the interior of the tank through said opening, said fitting having an outer surface, an end surface, and an inner surface;
a collar having a flange surrounding the periphery of said opening, a first wall surrounding said penetration fitting outer surface and extending towards the tank interior and generally perpendicular to said flange, and a second wall overlying said end surface and extending generally perpendicular to said first wall towards the center of said opening, said collar having a generally Z-shaped cross-sectional configuration;
means connecting said collar flange to the plastic sheet adjacent its opening; and
said first wall and said second wall of the collar being located in tight conformance with the outer surface and end surface respectively, of the penetration fitting, whereby a tight fit is provided between the plastic lining and the penetration fitting.

4,537,330

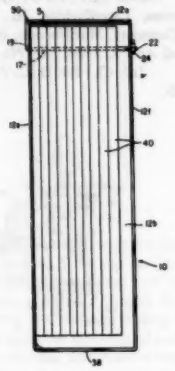
BAG DISPENSING SYSTEM

Edward Gelbard, Monte Carlo, Monaco, assignor to Wilverly Mansions I.B.V., Netherlands

Filed Apr. 1, 1983, Ser. No. 481,460
Int. Cl.³ B65D *83/00*
U.S. Cl. 221—26 **1 Claim**

1. A dispenser for plastic bags comprising two side panels, top and bottom panels and back panel forming a rigid container, a front panel hingedly connected to said bottom panel for closing said container, said front panel having flaps hingedly connected to the sides not connected to said bottom panel, each flap being approximately as long as its respective side and being approximately as wide as said side and top panels for supporting said front panel when said container is closed, said front panel being formed with a rectangular-

shaped perforated pull-out extending from the mid to lower portion thereof and into said bottom panel for exposing the interior of said container, the upper side of said rectangular-shaped pull-out being in the shape of a wide inverted V, and having a thumb-press portion provided at the vertex of the V, to facilitate initiation of perforation rupture, a generally U-shaped hanger having a base lying outside said container near the top thereof to facilitate securing said container to an outside support, said base having a portion in the shape of an inverted V to facilitate hanging said dispenser and having a pair of arms passing through and secured by said back and



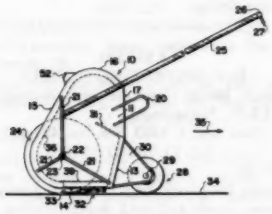
front panels near the respective tops thereof, said arms being formed with eyelets at their ends remote from said base, said eyelets lying outside said container and said arms being adapted to pass through holes formed in the bindings of pads of plastic bags to support said pads within said container, and a retainer formed with a pair of hooks respectively engageable in said eyelets, at least one of said hooks being S-shaped for snapping said retainer into engagement with said eyelets, whereby, when said pads of bags are thus supported within said container and said perforated pull-out is opened, said bags can conveniently be removed singly by users.

4,537,331

APPARATUS FOR DISPENSING VISCOUS MATERIALS

Joseph J. Matula, 114 Sanderson Ave., Winnipeg, Manitoba, Canada (R2R 1R4)

Filed Jun. 21, 1983, Ser. No. 506,362
Claims priority, application Canada, Aug. 13, 1982, 409445
Int. Cl.³ B67D *5/64*; A01C *3/06*
U.S. Cl. 222—165 **24 Claims**



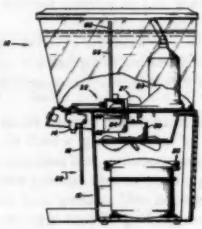
1. A dispensing apparatus for viscous materials such as asphalt or the like comprising in combination a container, ground engaging wheels one upon each side thereof, at least one handle extending therefrom, said container being rotatable upon said ground engaging wheels through approximately 120°, from a filling and transporting position, to a dispensing position and vice-versa, said container including a filling opening, which, when said container is in the filling and transporting position, is substantially on the upper side thereof, material dispensing means in one wall thereof, a spreader chain assembly on said one wall adjacent said dispensing means, said spreader chain assembly engaging said one wall when in the filling and transporting position whereby the heat of the viscous material transfers to said spreader chain assembly and engaging the ground when said container is in the dispensing position and at least one support wheel journalled for rotation upon the upper side of said container when said container is in the filling and transporting position, said support wheel engaging the ground when said container is in said dispensing position, said dispensing means being in a non-dispensing position adjacent the upper side of said container when in said filling and transporting mode and in a dispensing position adjacent the lower side of the container, when said container is in a dispensing position.

4,537,332

BEVERAGE DISPENSER WITH IMPROVED IN-BOWL WHIPPER

Merle S. Brown, Cohasset, and William A. Arzberger, Medfield, both of Mass., assignors to Jet Spray Corp., Norwood, Mass.

Filed Sep. 30, 1982, Ser. No. 430,234
Int. Cl.³ B67D *1/10*
U.S. Cl. 222—190 **5 Claims**



1. In a beverage dispensing machine having a base and a bowl mounted above the base, a whipper assembly for frothing non-carbonated beverages dispensed by the machine comprising

a housing adapted to be immersed in the beverage in the bowl,

said housing having a top wall and a generally cylindrical side wall,

an outlet passage from the housing in the side wall, and a pair of inlet ports in the side wall distal from said outlet passage,

an impeller body in the housing having a driven magnet imbedded therein,

impeller blades formed on the top surface of the body, said blades not exceeding 1/16 inch in height,

fins mounted on the housing and extending downwardly toward the blades,

a drive magnet mounted in the base and magnetically coupled to the driven magnet in the impeller, and

a motor in the base connected to the drive magnet for rotating the impeller at 4000 to 8000 rpm.

4,537,333

AIRBORNE PARTICLE DISPENSER

Richard S. Bjerregaard, Boise, Id., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Jul. 20, 1981, Ser. No. 285,346
Int. Cl.³ G01F *11/10*
U.S. Cl. 222—345 **10 Claims**

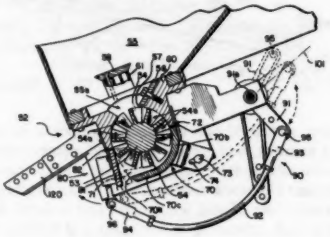
2. Apparatus for dispensing particulate agricultural material

at controllable uniform rates from an aircraft in flight comprising:

a housing having an inlet opening for receiving particulate material by gravity flow from a container carried by the aircraft, and having a dispensing opening;

a horizontal rotor mounted in said housing in clearance relation with an arcuate portion of the housing and having a plurality of material-receiving pockets and intervening rotor edges for moving the material from the inlet opening to the dispensing opening; and

a rigid blade fixed on said housing and having a blade edge in shear relation with said rotor edges,



said rotor edges and blade edge being disposed so as to be angularly oriented with respect to each other in the shear plane as the rotor blades move in shear relation across the fixed blade and thereby to present single points of shear intersection and reduce crushing of the particulate material; and

wherein said fixed blade edge extends parallel to the axis of the rotor and the rotor edges extend in a spiral about such axis so as to cross the fixed blade edge in an angular shear relation.

4,537,334

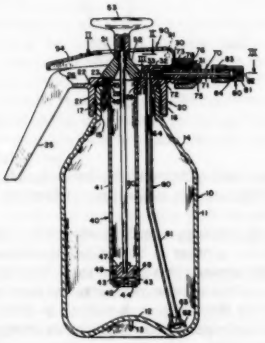
PORTABLE PRESSURE SPRAYER

William E. Spengler, Toledo, and William C. Ramsey, Bryan, both of Ohio, assignors to Tolco Corporation, Toledo, Ohio

Filed Jul. 18, 1983, Ser. No. 514,510

Int. Cl.³ B65D *83/00*

U.S. Cl. 222—401 **50 Claims**



1. A portable pressure sprayer comprising:

(A) a reinforced plastic container with a cut threaded neck having a top bevelled edge,

(B) a plastic cap means threaded on said neck having an integral handle and a nozzle connecting means,

(C) a manually operated pump means supported by said cap means including means for snap-locking said pump means to said cap means,

(D) a plastic siphon tube depending from said cap means into said container, and being in fluid communication with said nozzle connecting means,

(E) a nozzle means connectable to said nozzle connecting means and having a normally resiliently closed tubular valve means axially slidable in said nozzle means and in said nozzle connecting means,

(F) a lever means adjacent said integral handle and pivoted in said cap means for operating said tubular valve means, and

(G) diametrically opposite outward projecting means on said tubular valve means for engagement with said lever means, and substantially paralleled grooves on said nozzle connecting means on said cap means for said diametrically opposite outward projecting means.

4,537,335

FILLER MEANS FOR CHARGING CONTAINERS

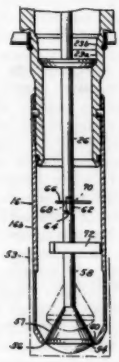
Badruddin K. Rangwala, Farmington Hills, and Toney S. Flack, Livonia, both of Mich., assignors to Ex-Cell-O Corporation, Troy, Mich.

Continuation of Ser. No. 382,889, May 28, 1982, abandoned.

This application Jun. 14, 1984, Ser. No. 620,581

Int. Cl.³ F16K *31/12*

U.S. Cl. 222—496 **14 Claims**



1. A filler valve assembly for filling containers with liquid products, said filler valve assembly comprising an upper body; a main body; a pressure-responsive assembly mounted so as to separate said upper and main bodies; spring means mounted between said pressure-responsive assembly and the upper end of said upper body; an inlet connection and opening in a side of said main body; a sleeve nozzle connected to the lower end of said main body; a valve seat formed at the lower end of said sleeve nozzle; a valve connected by rod means to said pressure-responsive assembly; orifice means formed in said main body, said orifice means including a cylindrical surface formed in said main body for a predetermined height and an adjacent member secured to said rod means to accommodate the flow therepast of a selected volume of fluid products, and a frust-conical surface formed just above said cylindrical surface for a second predetermined height for cooperation with said adjacent member secured to said rod means to accommodate the flow therepast of a larger selected volume of fluid products; said valve being urged by said spring means into engagement with said valve seat until such time as a measured volume of fluid product is communicated from a source of fluid product through said inlet opening to said main body, to thereby urge said pressure-responsive assembly upwardly against the force of said spring means and thereby lift said valve from said valve

seat and providing the pressure to vary said orifice means as required to correspond to the measured volume per unit time and to force an equivalent measured volume of fluid product through the space between said valve and valve seat into said containers.

4,537,336

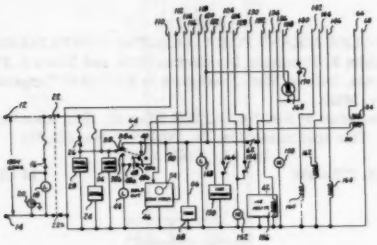
CONTROL SYSTEM FOR COLD DRINK MERCHANDISING MACHINE

Lee C. Verduin, Grand Rapids, and Michael J. St. Clair, E. Grand Rapids, both of Mich., assignors to Rowe International, Inc., Whippany, N.J.

Continuation of Ser. No. 226,252, Jan. 19, 1981, abandoned. This application Jun. 4, 1984, Ser. No. 616,696

Int. Cl.³ B67D *5/56*

U.S. Cl. 222—641 **6 Claims**



1. In a cold drink merchandising machine adapted in the course of a cycle of operation thereof to dispense a variety of drinks of different flavors, each of which drinks has a water component and a flavoring syrup component, said machine having respective syrup delivery means each of which is set to operate at the same rate and for the same period of time for a given size of drink and a water component delivery means and respective customer operated selecting means corresponding to said variety of drinks for initiating said cycle of operation of said machine, a control system comprising means responsive to said selecting means for actuating said water component delivery means, a plurality of internal service-person settable switches, each of said switches comprising an input terminal and a plurality of output terminals and settable means for connecting the switch input terminal selectively to the switch output terminals to cause the switch to produce a predetermined binary-coded signal at its output terminals in response to a signal at its input terminal, said settable means being set in accordance with the viscosities of said syrups to control the mix thereof with said water component, means responsive to actuation of said selecting means respectively to apply signals to the input terminals of said switches, and means including a microprocessor responsive to said binary coded signals for controlling said syrup delivery means to determine the point in said cycle at which said means is energized in accordance with the viscosity of the syrup being delivered thereby.

4,537,337

BOOT REMOVAL APPARATUS

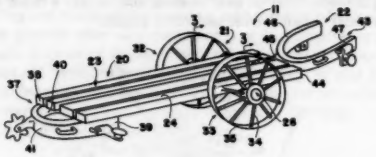
Vernon L. Girty, P.O. Box 1304, Forsyth, Mont. 59327

Filed Aug. 21, 1984, Ser. No. 642,882

Int. Cl.³ A47J *51/02*

U.S. Cl. 223—114 **12 Claims**

1. Boot removing apparatus including a platform portion, an undercarriage portion and a boot gripping portion; said platform portion including an elongated bed section, said bed section having a substantially rectangular configuration with a length significantly longer than the width thereof; said undercarriage portion including a transverse axle section extending under said bed section with free ends of said axle section extending beyond said edges of said bed section, wheels mounted on said free ends of said axle section, a first U-shaped member mounted under said bed section adjacent an end thereof, said first U-shaped member being mounted so free ends thereof are in contact with an underside of said bed section and an arcuate section thereof extends beyond said bed section, said free ends of said first member being aligned longitudinally of said bed section, said first U-shaped member having a thickness significantly less than a radius of said wheels to incline said bed section upwardly from said first U-shaped member; said boot gripping portion including a second U-shaped member extending from an end of said bed section opposite to said first U-shaped member, said second U-shaped member having a configuration substantially the same as said first U-shaped member, said second U-shaped member being disposed along a longitudinal center line of said bed section and secured thereto with said free ends extending beyond said bed section; whereby a user can place one foot on said bed section and insert a heel of a boot with a second foot therein into said second U-shaped member and withdraw said second foot from said boot.



4,537,338

BAGGAGE CARRIER FOR TWO-WHEELED VEHICLES

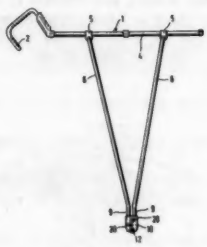
Heinrich Belka, Bielefeld, Fed. Rep. of Germany, assignor to Esge-Marby GmbH & Co. KG, Bielefeld, Fed. Rep. of Germany

Filed Apr. 12, 1984, Ser. No. 599,535

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1983, 3312994; Aug. 23, 1983, 3330286; Dec. 3, 1983, 3343844

Int. Cl.³ B62J *7/04*

U.S. Cl. 224—39 **18 Claims**



1. Baggage carrier for two-wheeled vehicles, comprising

a frame including the supporting surface for the baggage, and

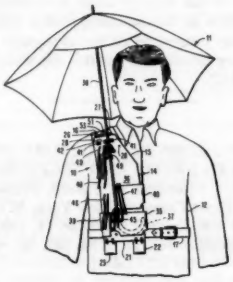
a pair of support legs extending downward from the frame toward one another at both sides, the legs of which are optionally secured in an articulated manner to the frame and extend toward one another in the form of a V and are bent at the free ends such that they extend beside and approximately parallel to one another, being spaced apart by a short distance from one another,

wherein the free ends of the legs of each pair of legs can be secured to an extension piece of the vehicle frame in an adjustable manner by means of a clamping part placed upon these ends, the clamping part having a bore for a fastening screw which passes between the two ends of the legs and through a bore in the extension piece,

wherein, in accordance with the invention,

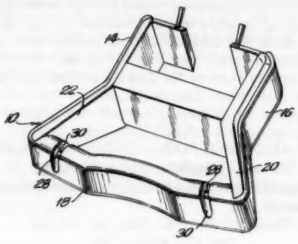
the clamping part (10) for each pair of support legs (6) has two continuous through bores (11), extending parallel to one another and disposed at both sides of the bore for the fastening screw (12), for the two associated cylindrical ends (9) of the legs, and wherein associated with the reception bores (11) is at least one clamping piece (15) cooperating with the inserted ends (9) of the legs, the clamping piece (15) being fastenable by means of a locking screw (20) against the ends (9) of the legs and against the clamping part (10), thereby fixing the ends (9) of the legs in their respective installed positions.

4,537,339
UMBRELLA SUPPORT
Beverly Pearson, 200 Blue Grass Dr., Richmond, Ky. 40475
Filed Jun. 19, 1984, Ser. No. 622,256
Int. Cl.³ F16M *13/00*
U.S. Cl. 224—188 **22 Claims**



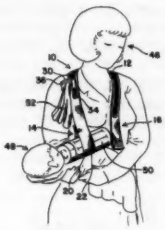
1. An umbrella support for holding an umbrella at a selected position irrespective of whether the umbrella has a short or long shaft and a curved or straight handle including:
support means for disposition on a user's body;
means to retain said support means on the user's body at a selected position;
said support means having first receiving means and second receiving means fixedly mounted thereon in vertically spaced relation to each other, said first receiving means being disposed beneath said second receiving means and receiving a handle of a relatively long umbrella shaft of an umbrella to be supported thereby, and said second receiving means receiving a handle of a relatively short shaft of an umbrella to be supported thereby, each of said first receiving means and said second receiving means receiving either a curved handle or a straight handle;
at least said second receiving means being formed of a non-rigid material so that said second receiving means does not block insertion of a handle of an umbrella shaft into said first receiving means;
a plurality of non-movable shaft guide means mounted on said support means above said second receiving means to receive a portion of the umbrella shaft having its handle supported by one of said first receiving means and said second receiving means;
each of said shaft guide means including means to hold a portion of the umbrella shaft therein;
said shaft guide means being spaced from each other in a substantially horizontal direction so that each of said shaft guide means provides a different angle to the umbrella shaft supported on said support means;
and securing means on said support means to secure to said support means a portion of the umbrella shaft extending from one of said first receiving means and said second receiving means, said securing means being separate from said shaft guide means and securing the portion of the umbrella shaft independently of said shaft guide means.

4,537,340
SUPPORT BRACKET FOR ELECTRONIC REMOTE CONTROL MODULE
Jeremy Waltzer, 22 Victorian La., Brookville, N.Y. 11545
Filed Aug. 29, 1983, Ser. No. 527,243
Int. Cl.³ A45C *11/00*
U.S. Cl. 224—202 **5 Claims**



1. A support bracket for an electronic remote control module adapted to enable the module to be conveniently held and braced against the body while in use to facilitate operation thereof with both hands comprising: a pair of generally parallel support arms extending in spaced apart relationship to each other adapted to hold therebetween an electronic remote control module; a brace member extending generally perpendicularly to said support arms adapted to be placed against the body of a user to enable said bracket to be braced thereby while in use, said brace member extending across a distance greater than the spacing between said support arms; and a pair of intermediate members each extending, respectively, from an end of one of said support arms between said support arms and said brace member, said intermediate members being arranged to extend obliquely relative to both said support arms and said brace member thereby to enable the inner sides of the wrists of a user to rest thereagainst during operation of a control module mounted between said support arms.

4,537,341
NURSING BOTTLE HOLDER
Oscar Kelly, 1834 Lencar Way, San Jose, Calif. 95124
Filed Aug. 2, 1984, Ser. No. 637,118
Int. Cl.³ A61J *9/06*
U.S. Cl. 224—202 **4 Claims**



1. A nursing bottle holder comprising:
(a) an elongated, flexible strip having a first end portion and a second end portion, said strip being adapted to be draped around an attendant's neck with said first end portion and said second end portion hanging substantially parallel to each other along said attendant's upper torso, said first end portion and said second end portion being unattached to each other;
(b) bottle holding means provided at said first end portion of said strip, said bottle holding means including a pair of

spaced apart fastener means attached to said first end portion such that said pair of fastener means can be engaged to form a loop at said first end portion, said loop being engagable with the circumference of a nursing bottle; and

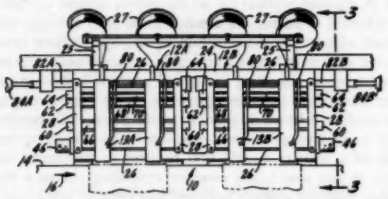
(c) counterbalance means provided at said second end portion of said strip, said counterbalance means including a counterbalance weight attached to said second end portion, said counterbalance means further including a pair of cooperating fastener means attached to said second end portion such that said second end portion may be formed into a loop to vary the position of said counterbalance weight and to shorten the overall extension of said strip.

4,537,342

BINDING MACHINE FOR A SIGNATURE MACHINE

William B. McCain, Hinsdale, Ill., and George D. Higgins, Kansas City, Mo., assignors to McCain Manufacturing Corporation, Chicago, Ill.

Filed Oct. 26, 1983, Ser. No. 545,217
Int. Cl.³ B27F *7/28*
U.S. Cl. 227—78 **4 Claims**



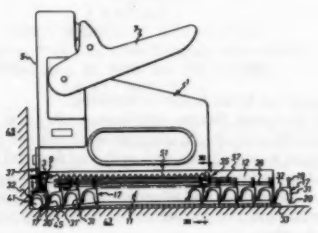
1. In a signature machine for assembling books, a plurality of signature feeders for feeding signatures onto a conveyor which advances unbound books to a binding machine, the improvement comprising a binding machine which can accommodate variable book thicknesses without adjustment during operation, the binding machine having multiple binding stations, each book being bound at one of the stations, the binding stations being independently adjustable such that each station can be set up prior to operation of the binding machine to bind books of a given thickness which is different from the thicknesses of books stitched at the other stations.

4,537,343

TOOL FOR FASTENING AN ELONGATED OBJECT ON A SUPPORTING SURFACE

Curt R. Johansson, Lagm.v.53, S-186 00 Vallentuna, Sweden

PCT No. PCT/SE83/00111, § 371 Date Nov. 7, 1983, § 102(e) Date Nov. 7, 1983, PCT Pub. No. WO83/03721, PCT Pub. Date Oct. 27, 1983
PCT Filed Mar. 28, 1983, Ser. No. 551,986
Claims priority, application Sweden, Apr. 5, 1982, 8202171
Int. Cl.³ B25C *5/11, 7/00*
U.S. Cl. 227—120 **10 Claims**



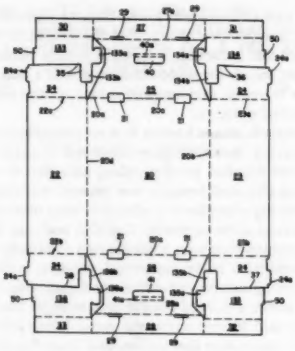
1. A tool for fastening an elongated object (41) on a wall or other supporting surface (43) by means of U-shaped clips (17) which are intended to embrace the elongated object and, by means of a fastening member (19) passing through one leg (31) of the clip, to be secured to the supporting surface, said tool comprising a magazine (11) for housing a strip of clips in the form of a continuous succession of mutually detachable clips (17), a feed device (35) which is adapted to feed the strip of clips in a direction towards a mounting station determined by an abutment member (9, 37) at the front end of the tool, and a driving device with a driving element (3) for driving the fastening member (19') of a clip (17') located at the mounting station into the supporting surface (43), characterized in that the magazine (11) has means for guiding a strip (17) of mutually detachable clips in a manner such that each individual clip carrying its fastening member (19) is oriented with its U-legs disposed one after the other in the plane of movement of the clips to be secured over the elongated object (41) oriented transversely of the longitudinal direction of the magazine, and that the abutment member (9, 37) is adapted to arrest the foremost clip (17') of the strip of clips in a substantially freely protruding position at the mounting station with the plane of the foremost clip transverse of the elongated object and to align the fastening member (19') of this clip with respect to said driving element (3).

4,537,344

INTERLOCKING CORNER STRUCTURE ON TRAY FOR FROZEN FRUITS AND VEGETABLES

Gilles R. Thomas, Mortagne au Perche, France, assignor to International Paper Company, New York, N.Y.

Continuation of Ser. No. 357,177, Mar. 11, 1982, abandoned. This application Sep. 25, 1984, Ser. No. 654,529
Int. Cl.³ B65D *5/22*
U.S. Cl. 229—34 R **3 Claims**



1. A container blank, said blank comprising:

(a) a rectangular section;

(b) two walls each connected at fold lines to a longitudinal side of said rectangular section;

(c) two walls each connected at fold lines to a transverse side of said rectangular section;

(d) a plurality of tabs each connected at fold lines to one of the longitudinal walls of said rectangular section;

(e) a plurality of flaps each connected at fold lines to one of the transverse walls and whose outermost extremity constitutes an outermost boundary of said blank;

(f) a plurality of engagement pieces, each of whose outermost extremities is parallel to those of said flaps and which is integral with one of said flaps; and

(g) a plurality of sliding pieces each of which is integral with a flap and each of which has appended thereto one or more feet, locking pieces, and locking tongues, said feet

and locking pieces, respectively, being appended to opposed edges of said sliding pieces, said transverse walls and said rectangular section having abutting indentations which form one or more holes at their points of intersection and said flaps having one or more holes adjacent their intersection with said transverse walls.

4,537,345

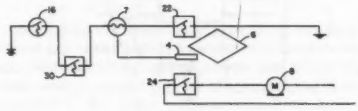
FLAME CONTROL SYSTEM FOR HEAT EXCHANGER

Claude D. Brown, Arvada, Colo., assignor to BBC Industries Inc., Grass Valley, Calif.

Continuation-in-part of Ser. No. 432,074, Sep. 30, 1982, Pat. No. 4,487,361, which is a continuation-in-part of Ser. No. 237,822, Feb. 25, 1981, abandoned. This application Feb. 2, 1983, Ser. No. 463,328

Int. Cl.[3] **F24D** *5/00*

U.S. Cl. 236—11 **12 Claims**



1. A heat exchange system comprising:

a thermostat controller for initiating and terminating a heat demand cycle;

a burner directly fluidly coupled to a fuel valve, said fuel valve being operable in the open position to provide a constant fuel supply to said burner and being operable in the closed position to prevent any fuel supply to said burner, said fuel valve being responsive to a heat demand signal from said controller;

a heat exchanger proximate the burner;

a heat duct distribution network arranged and adapted to direct heated fluid from said heat exchanger to a region to be heated; and

a temperature responsive switch electrically connected in series with said controller and said fuel valve, said switch arranged and adapted to sense the temperature at a chosen position in said heat duct distribution network remote from said heat exchanger to prevent the application of said heat demand signal to close said fuel valve when the temperature at said chosen position rises above a first temperature, and to permit the reapplication of said heat demand signal to open said fuel valve when the temperature at said chosen position drops below a second temperature.

4,537,346

FAIL-SAFE OIL FLOW CONTROL APPARATUS

Wayne R. Duprez, Waltham, Mass., assignor to Standard-Thomson Corporation, Waltham, Mass.

Filed Oct. 17, 1983, Ser. No. 542,522

Int. Cl.[4] **F01P** *7/16*

U.S. Cl. 236—34.5 **6 Claims**

1. Oil flow control apparatus adapted to be positioned within an internal combustion engine system having an engine, a heat exchanger, a conduit system and a fluid pump for forcing oil flow through the conduit system to the heat exchanger and to the engine, the conduit system having an outlet passage leading to the engine and an outlet passage leading to the heat exchanger and an inlet passage leading from the fluid pump, the inlet passage being encompassed by a valve seat, the conduit system having a connecting passage leading from the inlet passage to the outlet passage which leads to the engine, comprising:

a housing provided with an enclosing wall having an opening therethrough for communication between the housing and the outlet passage which leads to the engine,

a piston slidably movable within the housing,

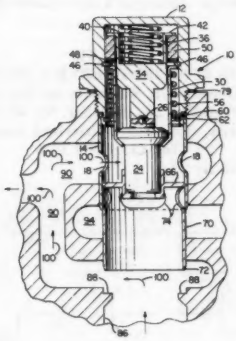
a sleeve valve attached to the piston and movable therewith to engage the valve seat to close the connecting passage, the sleeve valve being movable from the valve seat to open the connecting passage, the sleeve valve having a port therein, the sleeve valve being movable to position the port therein in communication with the outlet passage which leads to the heat exchanger for flow of fluid from the inlet passage, through the sleeve valve and through the port to the heat exchanger,

a thermally responsive actuator within the housing,

means attaching the thermally responsive actuator to the piston for movement of the piston with movement of the actuator,

a connector member within the housing,

means joining the connector member to the thermally responsive actuator,



a first spring member, the first spring member having a portion fixedly positioned within the housing and a portion in engagement with the connector member for urging movement of the connector member and the actuator away from the valve seat,

an abutment member movably positioned within the housing,

means operably joining the abutment member to the thermally responsive actuator for simultaneous movement of the actuator and the abutment member,

a second spring member, the second spring member being within the housing and in engagement with the abutment member and urging movement of the abutment member and the actuator toward the valve seat, the thermally responsive actuator moving the piston and the sleeve valve with respect to the abutment member and with respect to the valve seat, excessive pressure of fluid within the sleeve valve forcing movement of the piston and the sleeve valve in a direction away from the valve seat.

4,537,347

BI-DIRECTIONAL AIR DIFFUSER

Robert W. Noll, and Brian J. Noll, both of 800 Wikiup Rd., Santa Rosa, Calif. 95401

Filed Mar. 1, 1984, Ser. No. 585,336

Int. Cl.[3] **F24F** *7/00*

U.S. Cl. 236—49 **12 Claims**

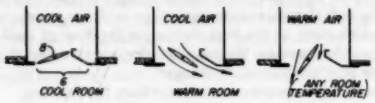
1. A bi-directional ceiling mounted air diffuser for discharging supply air into a room comprising:

output means for varying the orientation and size of an air diffuser discharge opening;

means for sensing the temperature of the supply air;

linkage operatively connecting said supply air temperature

sensing means to said output means so that when said supply air temperature is cool, said linkage operates to open said output means and direct said supply air generally parallel to the ceiling of said room, and when said supply air temperature is warm, said linkage operates to open said output means and direct said supply air generally vertically downward into said room, where said output means varies the size of said discharge opening so that the size of said discharge opening is smaller for warm supply air than for cool supply, thereby increasing the discharge velocity of a volume of warm supply air over the discharge velocity of a like volume of cool supply air.



4,537,348

SYSTEM FOR EFFICIENT SERVICE WATER HEATING

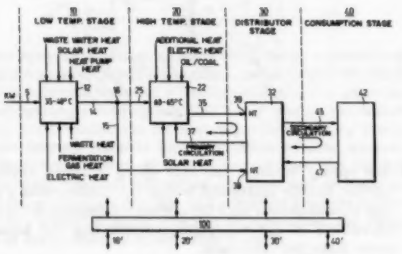
Hans Gössi, Oberdorf 25, Küssnacht am Rigi, Switzerland

Filed Dec. 28, 1982, Ser. No. 453,931

Claims priority, application Switzerland, Jan. 8, 1982, 106/82

Int. Cl.³ F24D *3/00*

U.S. Cl. 237—8 A **22 Claims**



1. A method for providing heated service water, comprising the steps of:

heating a quantity of service water to a lower temperature range in a lower temperature stage;

heating a quantity of service water to a higher temperature range in a higher temperature stage;

conveying service water between the lower and higher temperature stages through a first line means;

conveying service water directly and separately from each of the higher and lower temperature stages to a distribution stage through second line means;

mixing and circulating service water in the distribution stage;

conveying service water, from the distribution stage to a consumption stage draw-off point through a third line means, of one of the temperature ranges for a shorter time period than of the other temperature range, and conveying lower temperature stage service water directly to the distribution stage and then to the consumption stage without being mixed with service water of the higher temperature stage;

controlling flow of service water through the line means by valve means; and

monitoring operation of the method and regulating operation of the valve means with programmable control means.

4,537,349

MOTOR VEHICLE WITH AN INTERNAL-COMBUSTION ENGINE AND WITH MEANS FOR HEATING A PAYLOAD SPACE

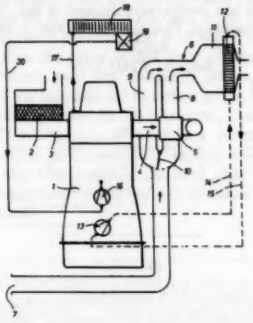
Albert Stolz, Tübingen, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jul. 5, 1984, Ser. No. 628,213

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1983, 3324138

Int. Cl.³ B60H *1/02*

U.S. Cl. 237—12.3 C **14 Claims**



1. A heating system for a motor vehicle with an internal-combustion engine, and a payload space, the heating system comprising:

an atmospheric relief pipe leading into the atmosphere through which air is transportable, the atmospheric relief pipe being formed to include at one end an inlet orifice for admitting air from one of the atmosphere and the payload space and at the other end an outlet orifice for discharging air back into the atmosphere, said atmospheric relief pipe being divided into a first pipe branch and a second pipe branch at a junction point;

a first heat exchanger in communication with an exhaust gas of the engine, the first heat exchanger being positioned in said first pipe branch to warm air flowing through the first pipe branch;

second heat exchanger means in communication with a liquid for cooling the engine, the second heat exchanger being positioned in the atmospheric relief pipe at a point downstream of the junction of the two pipe branches so that the air flowing through the atmospheric relief pipe intercepts the second heat exchanger to warm or cool selectively the liquid for cooling the engine;

and air dividing means for dividing the air between the first and second pipe branches.

4,537,350

SELF-ACTUATING DRINKING FOUNTAIN/FAUCET

Edward W. Apri, 998 Lehigh St., Altadena, Calif. 91001

Filed Jun. 27, 1983, Ser. No. 508,178

Int. Cl.³ E03B *9/20*

U.S. Cl. 239—25 **10 Claims**

1. An automatic drinking fountain and faucet assembly comprising:

a hollow housing;

inlet means for supplying water to said housing at one end thereof;

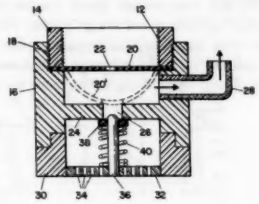
a drinking fountain outlet connected to said housing at a central portion thereof;

an outlet screen connected to said housing at the other end thereof;

a partition extending substantially across the open center of

said housing between said screen and the central portion of said housing, said partition having a central passage through the partition;

first valve means for normally closing said central passage, and for opening said passage when the water pressure exceeds a predetermined level;



second valve means for selectively permitting the flow of water from said water supply means to said fountain when the incoming water flows out of the fountain at low water flow and pressure levels, and for blocking water flow to the fountain as the water pressure and flow level are increased.

4,537,351

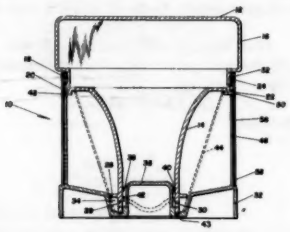
LIQUID AIR FRESHENER DISPENSER

Daniel C. Wilson, Taylors, S.C., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jul. 14, 1983, Ser. No. 513,551

Int. Cl.³ A61L *9/04*

U.S. Cl. 239—43 **14 Claims**



1. A vaporizing device comprising,

a base, said base including a perforated sleeve, a cylindrical plug and an annular well with said plug being located substantially centrally of said well and having diametrically opposed slots formed therein,

a container having a neck forming a mouth therefor, said neck having transverse diametrically opposed holes therein,

said container being mounted in inverted position on said base with said plug inserted in said neck thereof and with said sleeve being positioned in surrounding relation to at least a portion of said container, and

absorbent material positioned between said neck of said container and said sleeve and having a portion thereof extending into said annular well,

said base being angularly adjustable with respect to said container between two positions in one of which positions said transverse slots of said plug are out of alignment with the transverse holes in said neck and a liquid tight seal is effected between said plug and said neck whereby the flow of liquid out of said container is precluded, and in the other of which positions said transverse slots of said plug are in alignment with said transverse holes in ssid neck whereby liquid is allowed to flow from said container into said annular well to wet said portion of said absorbent material as long as there is access of air through the transverse slots of said plug and the holes of said neck to relieve the partial vacuum created in the container by the flow of liquid therefrom, said annular well having an outer wall and wherein a lip is provided on said neck, said lip being so formed and positioned that with the base in position on said container, said lip squeezes said absorbent material against said outer wall to prevent liquid from spilling from the device if waved about in the air.

4,537,352

FUEL INJECTION APPARATUS

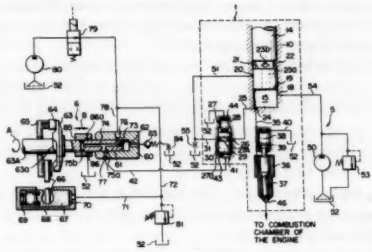
Masaaki Kato, Toyoake, and Tetsuji Akashi, Oobu, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Sep. 30, 1982, Ser. No. 430,609

Claims priority, application Japan, Oct. 5, 1981, 56-158499; Oct. 5, 1981, 56-158500

Int. Cl.³ F02M *47/02*

U.S. Cl. 239—90 **12 Claims**



1. A fuel injection apparatus for an internal combustion engine comprising:

(a) a fuel tank;

(b) a fuel injection unit mounted on an internal combustion engine for injecting fuel into a combustion chamber of said engine, said fuel injection unit having,

(i) a cylinder,

(ii) a driving plunger reciprocally held in said cylinder to form a pump chamber for receiving fuel from said fuel tank, said driving plunger being driven by said engine,

(iii) a timing port formed in said cylinder and opening to said pump chamber,

(iv) a nozzle holder communicated with said pump chamber;

(c) a fuel control pump operated by said engine for feeding out a fuel through an output port thereof, the amount of said fuel and the timing of feeding out said fuel responding to operational conditions of said engine;

(d) a timing passage communicating said pump chamber of said fuel injection unit with said fuel tank; and

(e) a control valve disposed in said timing passage for opening and closing said timing passage, said control valve having,

(i) a control chamber,

(ii) a control valve body reciprocally disposed in said control chamber,

(iii) a spring for biasing said control valve body in a direction of opening said timing passage, and

(iv) a timing chamber connected to said output port of said fuel control pump for driving said control valve body in a direction of closing said timing passage so long as the fuel from said fuel control pump is supplied into said

timing chamber, whereby the timing of fuel injection and the amount of the fuel injected through said fuel injection unit are controlled by said fuel control pump.

4. A fuel injection apparatus for an internal combustion engine having engine cylinders, comprising:

(a) a fuel tank;

(b) fuel delivery means connected with said fuel tank for delivering fuel from said fuel tank;

(c) fuel injection units each mounted on a corresponding one of said engine cylinders and including:

(i) cylinder means including a first cylinder and a second cylinder arranged in tandem;

(ii) plunger means including a fuel delivery plunger inserted in said first cylinder and reciprocated by said engine and an injection plunger inserted in said second cylinder;

(iii) pump chamber means including a first pump chamber defined by said first cylinder and one end of said fuel delivery plunger which is close to said second cylinder, a pressure chamber defined by said second cylinder and one end of said injection plunger which is close to said first cylinder, said pressure chamber communicating with said first pump chamber, and a second pump chamber defined by said second cylinder and the other end of said injection plunger;

(iv) an injection nozzle operatively connected with said second pump chamber for injecting fuel into said engine cylinder while fuel under pressure is supplied from said pump chamber means to said injection nozzle, and

(v) a timing port formed in said first cylinder and opening to said first pump chamber;

(d) a timing passage for allowing fuel in said pump chamber means to drain when said timing port is connected with said timing passage;

(e) a control valve connected with said timing passage for opening and closing said timing passage and including:

(i) a control chamber;

(ii) a control valve body disposed in said control chamber and movable between an open position in which said timing passage is opened and a closed position in which said timing passage is closed, whereby fuel injection from said injection nozzle is controlled,

(iii) urging means for normally urging said control valve body to be disposed in said open position, and

(iv) a timing chamber formed adjacent said control valve body in said control chamber for receiving fuel to move said control valve body to said closed position against said urging means; and

(f) a fuel control pump having as many output ports as said engine cylinders and wherein each of said output ports communicates with said second pump chamber of a corresponding one of said fuel injection units and with the timing chamber of the control valve of the fuel injection unit which is adjacent to said one of said fuel injection units and with the engine cylinder with which said adjacent fuel injection unit it connected, whereby, when fuel is delivered from said fuel control pump through said output ports the fuel is supplied to said second pump chamber of said one of said fuel injection units and the timing chamber of the control valve of said adjacent fuel injection unit to close the timing passage of said adjacent fuel injection unit; and said fuel injection unit also comprises a metering port formed in said second cylinder and communicating with said second pump chamber, and a drain port formed in said second cylinder and opening to said pressure chamber when said injection plunger is moved toward said pressure chamber, for a predetermined length to drain fuel in said first pump chamber through said drain port.

4,537,353

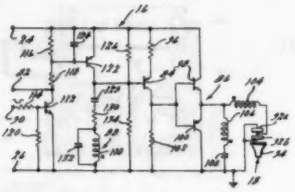
LOW-POWER ACOUSTIC INJECTOR DRIVE CIRCUIT WITH ENHANCED TURN-ON

Donald Speranza, Canton, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Feb. 28, 1983, Ser. No. 470,794

Int. Cl.³ B05B 3/14

U.S. Cl. 239—102 **21 Claims**



1. An acoustic fuel injector system comprising:

a mechanically resonant injector structure responsive to an alternating current excitation signal to atomize fuel supplied thereto;

oscillator circuit means for producing said alternating current excitation signal in response to a control signal; and

a DC-to-DC converter for producing a selectively variable regulated output voltage from an unregulated supply, whereby power applied to said injector structure varies as a function of converter output voltage level.

4,537,354

ORIFICE VALVE FOR AN ULTRASONIC LIQUID ATOMIZER

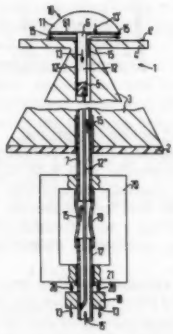
Gerhard Eith, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 1, 1983, Ser. No. 470,958

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1982, 3209139

Int. Cl.³ B05B 3/14

U.S. Cl. 239—102 **7 Claims**



1. An ultrasonic liquid atomizer with an orifice valve, comprising: an ultrasonic oscillator having an atomizer plate; axial bore means in the oscillator and atomizer plate for liquid supply onto a surface of the atomizer plate; impact body means for deflecting and distributing supplied liquid on the atomizer plate; the impact body means having a stem which is situated in the axial bore means of the oscillator and of the atomizer plate, the impact body means being approximately centered over said bore means; the stem of the impact body means being continued in the form of a retaining element extending through the axial bore means beyond the oscillator through a liquid supply

tube connected to the axial bore means at a side opposite the atomizer plate; an end of the retaining element opposite the stem being secured to a component means for executing a motion of the impact body means relative to the atomizer plate such that an orifice opening at the surface of the atomizer plate between the atomizer plate and impact body means can be selectively closed when desired via the retaining element and the stem of the impact body means; said component means comprising a tube which is guided in sliding fashion on a retaining or mounting element of the liquid atomizer; and the tube being connected to a socket piece of the liquid atomizer via an elastic hose part such that a liquid line feed-through is formed.

4,537,355

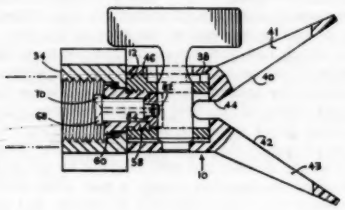
SPRAY TIP

Oliver J. Calder, Orange, Calif., assignor to Phyllis Graham, Orange, Calif.

Continuation of Ser. No. 457,919, Jan. 14, 1983, Pat. No. 4,484,707, which is a continuation-in-part of Ser. No. 442,525, Nov. 18, 1982, Pat. No. 4,483,481, which is a continuation of Ser. No. 165,247, Jul. 2, 1980, abandoned. This application Jan. 30, 1984, Ser. No. 575,153

Int. Cl.³ B05B *15/02*

U.S. Cl. 239—119 **6 Claims**



1. A spray tip comprising:

a housing having a longitudinal through passageway and an intersecting orthogonal cylindrical bore;

a cylindrical turret member rotatably seated in said intersecting cylindrical bore and having a transverse bore in alignment with said through passageway;

a spray tip orifice member mounted in said transverse bore;

a hard surface seal support received in said longitudinal through passageway and having a central through passage and a cylindrical concave seal support surface facing said turret member;

a thin layer seal supported by said cylindrical concave seal support surface and seated against said turret member and formed of a plastic having a low coefficient of friction and having a uniform thickness from about 0.001 to about 0.1 inch, sufficient to resiliently seal, but insufficient to sieze said turret member when compressively loaded; and

a retainer cap nut on said housing to secure said housing to a spray gun and a plastic tee seal received within said nut for capture between the end of said spray gun and said seal support, thereby providing compression means for axially compressing said seal support and seal sufficiently against said turret member to prevent leaking

whereby said turret member can be readily rotated by hand to reverse the position of the spray orifice in the assembly without releasing said compression means.

4,537,356

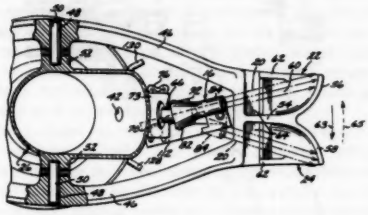
DRIVE ASSEMBLY FOR A REACTION DRIVE SPRINKLER

Kenneth L. Lawson, Ontario, Calif., assignor to Rain Bird Sprinkler Mfg. Corp., Glendora, Calif.

Filed May 7, 1984, Ser. No. 607,579

Int. Cl.³ B05B *3/08*

U.S. Cl. 239—230 **17 Claims**



1. A rotatable water sprinkler, comprising:

a range tube having a flow path therethrough for receiving water from a water supply pipe and for discharge projection of the water generally outwardly therefrom, said range tube further defining a relatively small bleed opening for bleed passage of a relatively small water stream from said flow path;

means for rotatably mounting said range tube on the water supply pipe;

a fixed drive nozzle on said range tube for discharge projection of the relatively small water stream outwardly from the sprinkler;

drive means pivoted with respect to said range tube and including first and second oppositely oriented deflector spoons for interrupting engagement with the relatively small water stream to rotatably drive said range tube respectively in opposite rotational directions with respect to the water supply pipe;

diverter means movable between a first position for guiding the relatively small water stream discharged from said drive nozzle in a first direction for interrupting engagement by said first deflector spoon and a second position for guiding said small water stream in a second direction for interrupting engagement by said second deflector spoon; and

reversing means responsive to the rotational position of said range tube with respect to the water supply pipe for shifting said diverter means between said first and second positions.

4,537,357

SPRAY GUNS

Samuel W. Culbertson, Arvada, Colo., and George Dixon, West Midlands, England, assignors to Binks Manufacturing Company, Franklin Park, Ill.

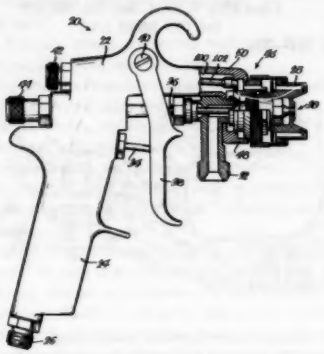
Continuation-in-part of Ser. No. 374,257, May 3, 1982, abandoned. This application Oct. 5, 1984, Ser. No. 658,209

Int. Cl.³ B05B *1/28*

U.S. Cl. 239—290 **19 Claims**

1. A spray gun having a gun body and a spray head assembly carried at a forward end of said body for emitting an atomized spray of fluid, said spray head assembly comprising a fluid inlet fitting separate from said gun body and having a passage therethrough connectable at one end with a supply of fluid; a fluid nozzle having a passage therethrough terminating at one end in a fuid outlet orifice; a fluid nozzle retainer detachably connected with said fluid inlet fitting and said fluid nozzle for supporting the same with opposite ends of said passage in communication, whereby fluid introduced into said one end of said inlet fitting passage flows through said passages for being emitted from said orifice; air emitting means at said one end of

said fluid nozzle for emitting air for flow against fluid emitted from said outlet orifice, said air emitting means being detachably connected with said fluid nozzle retainer; and a member integral with and extending from said forward end of said gun



body, said inlet fitting and fluid nozzle retainer compressibly capturing said member therebetween without threaded connection therewith when the same are detachably connected to mount said spray head assembly on said member at said forward end of said gun body.

4,537,358

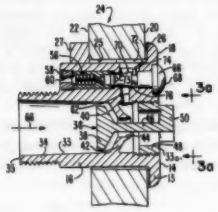
NOZZLE FOR WATER TUB

George F. Anderson, Mountaintop, Pa., assignor to U.S. Leisure Incorporated, Incline Village, Nev.

Filed Sep. 27, 1982, Ser. No. 423,769

Int. Cl.³ B05B *7/02*

U.S. Cl. 239—413 **9 Claims**



1. A fluid nozzle for a water tub comprising: a unitary nozzle body having means defining a main bore therethrough, said nozzle body adapted to receive a flow of water through the main bore; means carried by the main bore defining means and within the main bore for adjustably controlling the volume rate of flow of water therethrough, there being means coupled with the control means, independent of said main bore defining means, and accessible at the outlet end of the main bore for adjusting said control means, said nozzle body having a secondary bore adjacent to the main bore; a spring-biased check valve in the secondary bore for permitting a flow of air in one direction therethrough, said body having a third bore placing the secondary bore in fluid communication with the main bore near the outlet end thereof, the third bore having one end in fluid communication with the main bore at the outer periphery of the main bore; means coupled with said nozzle body for adjusting the volume rate of flow of air through the third bore, whereby air can flow past the check valve and into the main bore to aerate the water flowing therethrough.

4,537,359

FUEL INJECTION NOZZLES

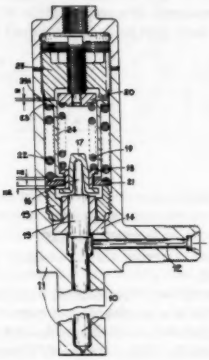
Robert T. J. Skinner, High Wycombe, England, assignor to Lucas Industries, p.l.c., Birmingham, England

Filed Sep. 26, 1983, Ser. No. 535,696

Claims priority, application United Kingdom, Oct. 20, 1982, 8229951

Int. Cl.³ F02M *61/18, 61/20*

U.S. Cl. 239—533.6 **4 Claims**



1. A fuel injection nozzle for supplying fuel to an internal combustion engine, the nozzle being of the so-called inwardly opening type including a valve member slidable within a bore, resilient means biasing the valve member into contact with a seating defined at one end of the bore, a fuel inlet passage through which fuel under pressure can act upon the valve member to lift the valve member away from the seating against the action of the resilient means, thereby to allow fuel flow through an outlet, said resilient means comprising a first coiled compression spring acting on said valve member through an abutment carried by the valve member, a second coiled compression spring, an abutment plate engaged by one end of said second coiled compression spring, a part positioned on the valve member so as to be movable therewith, said abutment and said part defining a lower surface on the abutment and an upper surface on said part between which surfaces is located said abutment plate, whereby said abutment plate is positioned so as to be engaged by said part after a predetermined movement of the valve member against the action of the first coiled compression spring, a tubular member having an outwardly extending flange which forms an abutment for the other end of the second coiled compression spring and an inwardly directed flange which in the closed position of the valve member engages the lower surface defined by said abutment carried by the valve member, and means operable during the opening movement of the valve member to halt the movement of said tubular member before said abutment plate is engaged by said part, whereby the initial movement of the valve member is against the action of the first coiled compression spring and the final movement of the valve member is against the action of both compression springs.

4,537,360

STREAM-CONTROLLING DEVICE FOR FAUCETS

Robert E. Bock, Woodbury, Conn., assignor to WPM, Inc., Waterbury, Conn.

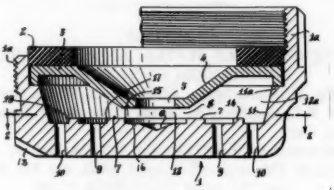
Filed May 20, 1983, Ser. No. 496,521

Int. Cl.³ B05B *1/14*

U.S. Cl. 239—553.3 **6 Claims**

1. A stream-controlling device for faucets, which comprises a generally cylindrical hollow casing having bottom and side walls and an annular threaded upper portion adapted for secur-

ing the casing to an annular threaded portion of a faucet, a flow restrictor of circular form mounted in said casing and forming with said bottom and side walls a circular chamber, the flow restrictor having a central first orifice for passage of liquid from the faucet to said chamber, said restrictor having a conical portion forming a conical upper surface sloping downwardly and inwardly toward said first orifice, said conical portion also forming a conical lower surface sloping upwardly and outwardly from said first orifice, said bottom wall having an imperforate central conical recess opposite said orifice, said bottom wall and the lower end of said conical lower surface defining an annular second orifice, the conical wall of said recess being arranged to deflect liquid from said first orifice radially outward through said second orifice, the lower surface



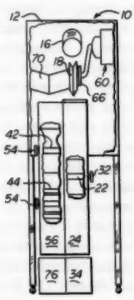
of the restrictor forming with said bottom and side walls an annular sub-chamber of said chamber for receiving liquid from said second orifice, said sub-chamber increasing substantially in height in the radial direction from the second orifice to said side wall, the conical wall of said recess forming with the horizontal an angle no greater than the angle formed by said conical lower surface with the horizontal, said bottom wall having a multiplicity of holes located radially outwardly beyond said imperforate central conical recess and at different radial distances from said conical recess and constituting in sum total a third orifice for discharging liquid from said casing, said holes extending through said bottom wall in a downward direction generally parallel to one another, and said first, second and third orifices being of progressively increasing throughflow area.

4,537,361

APPARATUS FOR BREAKING GLASS BOTTLES AND CRUSHING CANS AND LIKE CONTAINERS

Henry R. Heimerich, Lynbrook, N.Y., assignor to Boro Recycling Center, Inc., Brooklyn, N.Y.

Filed Sep. 2, 1983, Ser. No. 529,159
Int. Cl.³ B02C *19/14*
U.S. Cl. 241—81 **13 Claims**



1. Amended apparatus for disintegrating used glass containers and for sufficiently crushing or deforming used metallic and plastic containers to preclude reuse of such types of containers, said apparatus comprising

a housing,

glass container disintegrating means disposed in said housing,

metallic and plastic container crushing means disposed in said housing situate proximate said glass container disintegrating means,

entry chute means carried on said housing for introducing containers into said housing, the course of said chute being disposed such as to provide a gravity induced and supported container travel along a predetermined course in line with said glass container disintegrating means, said chute means including an extension piece which girds a portion of the container periphery, and

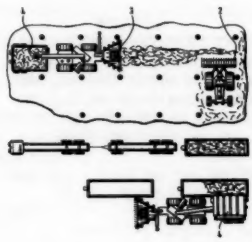
diverter means carried within said housing and operative to divert any metallic and plastic container introduced therein from its travel along said predetermined course and cause it to be delivered to said metallic and plastic container crushing means, said diverter means comprising an air flow generator discharging a flow of air in a container diverting stream across said container course and including an air manifold extending longitudinally of said travel course adjacent thereto, the quantity and velocity of said flow being sufficient to displace metallic and plastic containers from their girded embrace on said extension piece but insufficient to divert a glass container from its travel in said course.

4,537,362

SYSTEM FOR MECHANICALLY GATHERING TREES, BUSHES AND BRANCHES

Jose M. A. Zuloaga, Pamplona, Spain, assignor to Biomasa, S.A., Spain

Filed May 14, 1982, Ser. No. 378,216
Int. Cl.³ A01D *55/00*
U.S. Cl. 241—101.7 **7 Claims**



1. A system for collecting ground strewings comprising trees, bushes, branches, bark, leaves and toppings and for separating foliage therefrom, said system comprising:

(a) a first moving machine for placing said strewings in rows, said machine including a rake with a plurality of prongs of different shapes, said prongs being straight or concave with respect to the direction of movement of said first machine;

(b) a second moving machine for travel along said rows, said second machine including

(i) means to pick up said strewings;

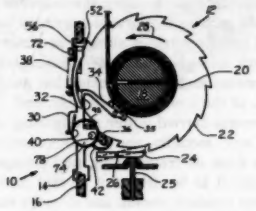
(ii) means to shred said strewings; and

(iii) means to pneumatically separate foliage from said shredded strewings to form foliage-free shreddings.

4,537,363
LOCK-UP MECHANISM FOR A VEHICLE SENSITIVE AUTOMOTIVE SEAT BELT RETRACTOR

Rudy V. Thomas, Sterling Heights, Mich., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Aug. 30, 1984, Ser. No. 646,394
Int. Cl.³ A62B *35/02*; B65H *75/48*
U.S. Cl. 242—107.4 A **17 Claims**



8. A lock-up mechanism for vehicle sensitive seat belt retractor having a base plate, a spool rotatably attached to the base plate, a length of seat belt webbing wound on said spool, a spring motor for retracting the seat belt webbing on the spool, a ratchet wheel attached to the spool and rotatable therewith, a lock bar pivotally attached to the base plate adjacent to the ratchet wheel, and an inertia sensor for pivoting the lock bar to engage the ratchet wheel to prevent unwinding of the webbing from the spool in response to the inertial forces of a vehicular crash, the lock-up mechanism characterized by:

a frame adapted to be connected to the base plate adjacent to the spool;

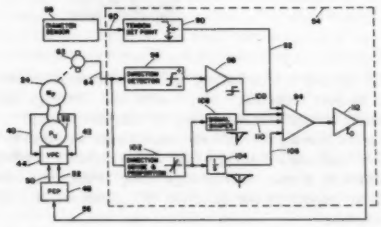
a shuttle slidably disposed in said frame, said shuttle movably displaced between a first position when the webbing is unwound from the spool and a second position when the webbing is wound on the spool; and

lock pawl means pivotally attached to said frame, said lock pawl means displaceable between a locked position pivoting the lock bar to engage the ratchet wheel in response to said shuttle being displaced to said first position, and a reset position disengaged from said lock bar in response to said shuttle being displaced to said second position.

4,537,364
CONSTANT TENSION CABLE REEL DRIVE

Frederic W. Pollman, Ames; David W. Reynolds, Huxley, both of Iowa, and Richard Heiser, Wayzata, Minn., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 15, 1982, Ser. No. 449,920
Int. Cl.³ B65H *75/42*
U.S. Cl. 242—86.51 **12 Claims**

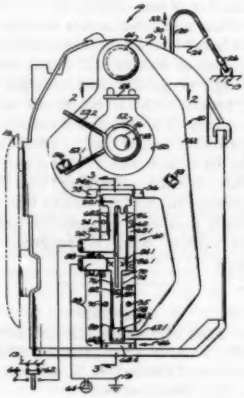


1. A control system for use with a vehicle mounted cable reel, a hydraulic motor for driving said cable reel, a source of hydraulic fluid under pressure for driving said motor, and said control system modulating the fluid flow from said source to said motor comprising; flow control means responsive to the fluid pressure differential across said motor which represents a torque feedback signal, electrohydraulic transducer means providing an input command signal to said flow control means, basic command means providing a basic signal for controlling said transducer means, speed sensing means responsive to the rotation of said cable reel to provide a speed signal proportional to cable reel rpm, transient condition command means receiving said speed signal and differentiating said speed signal to provide an acceleration signal, said acceleration signal being further provided to said transducer means to modify said basic signal in response to cable reel deceleration and acceleration to form said command signal, said flow control means responding to said command signal to drive said motor in a manner which reaches equilibrium between said torque feedback signal and said command signal.

4,537,365
SAFETY SEAT BELT SYSTEM AND LATCH RELEASE MECHANISM USED THEREIN

Henry Ty, Attleboro, Mass., and Alfred J. White, North Providence, R.I., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 333,234, Dec. 21, 1981, abandoned. This application Jul. 6, 1982, Ser. No. 395,533
Int. Cl.³ A62B *35/02*; B65H *75/48*
U.S. Cl. 242—107.6 **24 Claims**



1. An electrically operable control mechanism comprising an insulating support, a first thermally responsive bimetal strip, a second thermally responsive bimetal strip welded to the first bimetal strip to form a reverse bimetal, the reverse bimetal having one end secured to the support and having a control portion at its opposite end movable between control positions, and means for directing electrical current through at least a selected portion of the reverse bimetal for self-heating the reverse bimetal, the first and second strips having corresponding thermal response characteristics for maintaining the control portion of the reverse bimetal in a selected control position during changes in ambient temperature, the first strip having relatively greater electrical resistivity than the second strip to be more rapidly self-heated to move the control portion between control positions to perform a control function when electrical current is selectively directed through said selected portion of the reverse bimetal, the first bimetal strip having a U-shape being welded to the second strip and the ends of the two legs of the U-shape being secured to the support in fixed position relative to the support, and the means directing electrical current through the reverse bimetal directing current

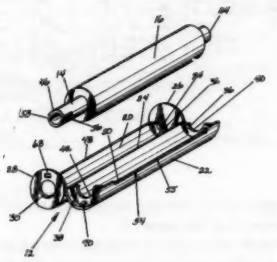
through the two legs of the U-shape in series for more rapidly self-heating the first strip of the reverse bimetal.

4,537,366

ROLL CONTAINER

Kirk A. Swenson, 6516 Longview Beach Rd., and Robert E. Swenson, 1932 Utica Pike, both of Jeffersonville, Ind. 47130

Filed Jul. 13, 1983, Ser. No. 513,455
Int. Cl.³ B65H *49/18*
U.S. Cl. 242—137 **12 Claims**



1. A roller container comprising:

a first generally semi-cylindrically shaped shell having a generally circularly shaped end wall at one of its ends and an annularly shaped wall at the opposite one of its ends;

a second generally semi-cylindrically shaped shell adapted to be selectively located in registered concavely facing relationship to the first shell so that the first and second shells cooperate to form a generally cylindrically shaped housing;

a spindle having a length substantially longer than the length of the housing adapted to be removable located within the housing for rotational movement about the longitudinal axis of the housing and having one end projecting from an end of the housing through the bore defined by the annular end wall of the first shell, the spindle is hollow with the projecting end being open and adapted to receive drawing instruments in its hollow interior for storage;

a web of material spirally wound on the spindle, the width of the web being somewhat less than the length of the housing, and the web being asymetically located between the ends of the spindle;

a pair of flanges associated with at least the first shell or second shell spaced apart longitudinally of the shell by a distance generally equal to the width of the web wound on the spindle and adapted to cage the web wound on the spindle therebetween for limiting the longitudinal movement of the spindle within the housing when the first and second shells are in cooperating relationship to form the housing;

an elongated notch formed in one longitudinal edge of one of the shells, the longitudinal edge of the elongated notch being recessed inwardly of the convex surface of the shell in which it is formed, when the shells are in concavely facing relationship one longitudinal edge of the other one of the shells lays in juxtaposition to the open side of the elongated notch and cooperates to define a slot having a length generally equal to the width of the web; and,

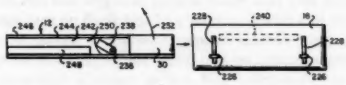
a cap attached to the projecting end of the spindle so that the the spindle is rotatably movable with the cap, the cap is adapted to be removably attached to the spindle to open and close access to the hollow interior of the spindle.

4,537,367

HIGH SPEED BIDIRECTIONAL MAGNETIC TAPE TRANSPORT WITH CONSTANT TENSION

Lawrence Herrington, and Raymond E. Avra, both of Fountain Valley, Calif., assignors to MegaTape Corporation, Duarte, Calif.

Division of Ser. No. 285,756, Jul. 22, 1981, Pat. No. 4,445,650. This application Feb. 29, 1984, Ser. No. 584,593
Int. Cl.³ G03B *1/04*; B65D *85/67*
U.S. Cl. 242—198 **2 Claims**



1. A tape cartridge for use in a tape transport, the cartridge comprising the combination of:

a generally enclosed housing of relatively thin, generally planar configuration having a hollow interior and a front edge;

a length of magnetic tape disposed within the hollow interior of the housing;

means for directing the length of magnetic tape through a path adjacent the front edge of the housing; and

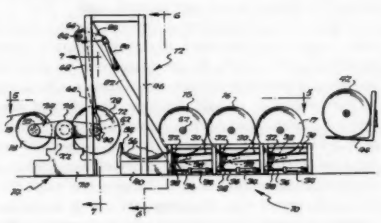
a door comprising a substantial portion of and extending across the entire width of the front edge of the housing and having opposite ends pivotally coupled to opposite sides of the housing along a common axis, the door normally assuming a closed position in which it encloses the housing at the front edge and being pivotable upwardly and away from the housing into an open position so as to expose the hollow interior of the housing at the front edge and provide access to a portion of the length of magnetic tape, the door having a pair of camming levers mounted thereon at the opposite ends thereof and adapted to pivot the door into the open position when engaged, the housing having a groove in each of the opposite sides thereof adjacent the camming levers for receiving an elongated protrusion therein when the cartridge is mounted in place and the camming levers being mounted at an angle relative to the groove when the door is closed so as to be engaged and pivoted by elongated protrusions to raise the door to the open position as the cartridge is mounted in place.

4,537,368

PENDULUM ROLL LOADER

Robert R. Radmore, Olcott, and John T. Hall, Williamsville, both of N.Y., assignors to Carborundum Abrasives Company, Niagara Falls, N.Y.

Filed May 1, 1984, Ser. No. 605,789
Int. Cl.³ B65H *19/30*
U.S. Cl. 242—58.6 **4 Claims**



1. Apparatus for handling rolls of material, said apparatus including storage means for storing a plurality of rolls of material, an unwinder device including means for receiving a shaft

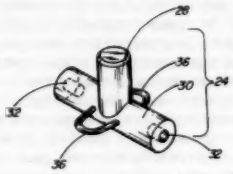
of one of said rolls and supporting said shaft during unwinding of the material thereon, transfer means for sequentially indexing each of said plurality of rolls of material from said storage means to said unwinder device, said transfer means including lift means for raising one of said rolls of material, cam means for axially positioning said roll into alignment with said means for receiving a shaft during lifting of said roll by said lift means, said lift means including anti-friction means for supporting said roll of material and providing freedom of movement axially of said roll, a roll shaft carried by said roll of material and engageable with said cam means during lifting of said roll for moving said roll in a direction axially of said shaft on said anti-friction means, said transfer means including a frame, hook means pivotally mounted on said frame and engageable with said roll shaft for supporting said roll of material following precise positioning of said roll shaft by said cam means.

4,537,369

ADAPTER FOR TOWING AIRCRAFT

Huntley H. Perry, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 11, 1983, Ser. No. 540,970
Int. Cl.³ B64D *3/00*
U.S. Cl. 244—1 R **2 Claims**



1. Apparatus for connecting a towing device, having laterally spaced arms with attachment means at the ends thereof, to an aircraft having a fuselage, said apparatus comprising:

a socket member fixed in the bottom of said fuselage along the centerline thereof, said socket member comprising a cylindrical tube having a closed end interior to the fuselage and an outward flange by which said socket member is attached to said fuselage, said socket member defining a vertically extending cylindrical recess in said fuselage accessible from the exterior thereof; and

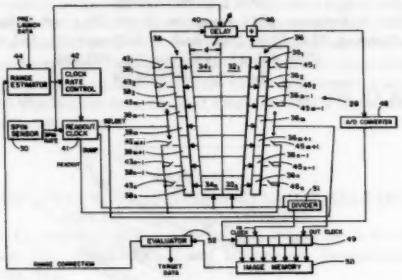
a towing adapter comprising a vertical section received in said recess, an elongated horizontal section integrally attached at its middle to the lower end of said vertical section and rotatable between transverse positions relative to the centerline of said fuselage and aligned positions relative thereto, said horizontal section having horizontal recesses in the opposite ends thereof for pivotal engagement by horizontal pins of said attachment means when the horizontal section is in said transverse positions, and first and second ring members extending laterally from opposite sides of the middle of said horizontal section for pivotal engagement by hooks of said attachment means when said horizontal section is in said aligned positions, whereby said apparatus is optionally operable with different towing devices.

4,537,370

OPTICAL GROWTH COMPENSATOR

Vito F. Pizzurro, Villa Park, Calif., assignor to Ford Aerospace & Communications Corporation, Detroit, Mich.

Filed Nov. 2, 1983, Ser. No. 548,183
Int. Cl.³ F41G *7/22*
U.S. Cl. 244—3.16 **10 Claims**



1. A method of moving target acquisition by a spinning body, comprising the steps of:

(a) using the spin of said body to scan an area ahead of the body, with a multi-element sensor fixed with respect to said body, to produce an image;

(b) sotring said image in pixel form;

(c) predicting, on the basis of pre-programmed expected trajectory information, position changes of stationary objects in said image in time-spaced frames of said scan due to optical growth of said image as a result of closing range;

(d) compensating for said position changes in such a way as to cause said objects to be imaged in the same pixel in time-spaced frames; and

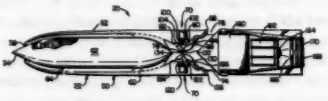
(e) identifying moving targets by their failure to be imaged in the same pixel in time-spaced frames.

4,537,371

SMALL CALIBER GUIDED PROJECTILE

William S. Lawhorn, Rockwall, and Ivan L. Clinkenbeard, Euless, both of Tex., assignors to LTV Aerospace and Defense Company, Dallas, Tex.

Filed Aug. 30, 1982, Ser. No. 412,827
Int. Cl.³ F41G *7/00*
U.S. Cl. 244—3.22 **27 Claims**



1. A guided projectile comprising:

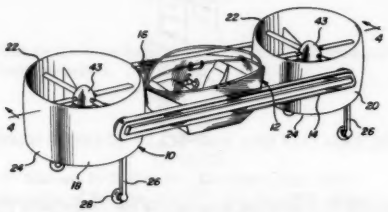
a projectile housing with diametrically opposed divergently oriented guidance nozzles mounted therein;

a supersonic external compression air inlet and subsonic diffuser for supplying air to the guidance nozzles; and

flow control means for selectively diverting air flow through said nozzles permitting input of lateral forces to the projectile, said flow control means comprising a bifurcated discharge arrangement with vortex generator means for generating a small vortex within each nozzle and downstream of said generator means to cause flow entrainment and attachment to the wall of the nozzle, thereby increasing flow through a selected one of said

nozzles, said flow control means further comprising a valve for selectively directing air into the non-selected nozzle downstream of said vortex generator means to permit aspiration and prevention of flow attachment to the boundary wall of the non-selected nozzle to impede flow through the nozzle.

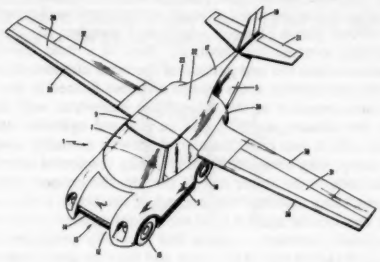
4,537,372
VTOL AIRCRAFT
Lorant Forizs, 983 Sunrise Dr., Tarpon Springs, Fla. 33589
Filed May 6, 1983, Ser. No. 492,233
Int. Cl.³ B64C *27/20, 29/00*
U.S. Cl. 244—12.4 **9 Claims**



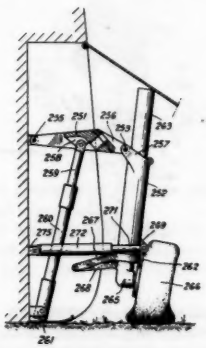
1. A VTOL aircraft including a fuselage defining front and rear ends, opposite sides and top and bottom portions, a pair of laterally spaced front-to-rear extending elongated support structures between adjacent sides of which said fuselage is mounted and including front and rear ends which project forward and rearward of said fuselage, a pair of front and rear tubular wings oscillatably supported between the front and rear ends of said support structures for angular displacement about axes extending generally along diametric planes of said tubular wings, said tubular wings including inlet and discharge ends, control means connected between said tubular wings and support structures operative to simultaneously and equally angularly adjust said tubular wings relative to said support structures between upright positions with said inlet ends opening upwardly and horizontal positions with said inlet ends opening forwardly, and motor driven rotor means journalled in said wings for intaking air through said inlet ends and discharging air from said discharge ends, the discharge ends of said tubular wings including axially endwise outwardly projecting landing gear struts mounted from opposite side portions of the discharge ends of said tubular wings, the free ends of said struts including ground-engaging elements, said motor driven rotor means, when said tubular wings are in their upright positions, being disposed in planes spaced appreciably above the center of gravity of the aircraft.

4,537,373
AIR VEHICLE HAVING DRIVEN WHEELS AND DUCTED FANS
Dennis D. Butts, 2057 S. Estrella Cir., Mesa, Ariz. 85202
Filed Aug. 16, 1979, Ser. No. 67,195
Int. Cl.³ B64C *37/00*
U.S. Cl. 244—22 **31 Claims**

6. Aircraft comprising:
a passenger section and fuselage;
landing gear, comprising driving and steering wheels mounted on said passenger section;
wing and tail assemblies mounted on said fuselage;
high speed fan means mounted in said fuselage for propelling the aircraft while airborne; and
means for driving said fan means and said driving wheels, said fan means having insufficient thrust to accelerate the aircraft into flight while at low speed on the ground during normal take-off operations, said aircraft being accelerated while on the ground by said driving wheels to speeds approaching approximately take-off speed at which speeds said fan means has sufficient thrust to accelerate said aircraft in flight and further including an airflow area formed below said passenger section, a substantially forward facing inlet opening and a pair of outlet ducts formed on opposite sides of said fuselage and communicating with said airflow area, said outlet housing said high speed fan means.



4,537,374
STRUCTURAL SUPPORTS AND AIRCRAFT LANDING GEARS INCLUDING SUCH SUPPORTS
Pierre Barnoin, Equilles; Jacques M. N. Mens, Marignane, and Gilbert Merle, Saint-Victoret, all of France, assignors to Societe Nationale Industrielle Aerospatiale, France
Filed Aug. 5, 1982, Ser. No. 405,647
Claims priority, application France, Aug. 10, 1981, 81 15432
Int. Cl.³ B64C *25/60*
U.S. Cl. 244—102 R **3 Claims**



1. Main landing gear for aircraft comprising a plurality of ground engaging elements each of which is carried by a leg in the form of a substantially vertical structural support; said support comprising a tubular outer element, an inner element telescopingly engaged in the outer element, one of which elements is capable of plastic deformation, a cage secured to the other of the elements at a location within the tubular outer element, a plurality of rolling members located in respective apertures in the cage and disposed between the inner and outer members, means on said other of the elements for locating the rolling members in a radial position to deform said one element plastically, and a frangible connection between the inner and outer elements which connection locks the inner and outer elements against relative axial movement but is adapted to fracture under a predetermined axial loading applied between the inner and outer elements, whereby fracture of the connection allows relative axial movement of the inner and outer elements which causes the rolling elements to deform said one

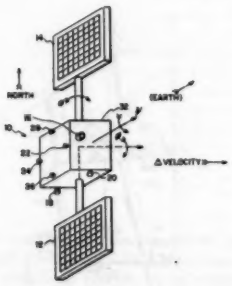
element plastically and dissipate energy from the force producing the movement, the inner element being tubular and having a tubular piston member mounted therein, and the support further comprising a closure member sealing one end of said inner element, the tubular piston member extending through the other end of the inner element, a transverse wall member in the tubular piston member which wall member has therein a throttling aperture for throttling flow of a fluid between a chamber within the end portion of the inner element closed by the closure member and a second chamber formed in the tubular piston member at the side of the transverse wall remote from the closure member, and an external cylinder member within which said outer tubular element is mounted; and further comprising a balance beam pivotally connected intermediate its ends to the lower end of the leg, the ground engaging element being mounted on one end of the beam, a ring encircling and located against axial movement relative to the external cylinder member, a radius link pivotally connected at its ends to the other end of the beam and the ring about respective horizontal axes, a radially-extending frangible pin securing the ring rotationally to the external cylinder member which pin is adapted to shear when a force above a predetermined value is applied to the ground-engaging element in a direction to swivel the ground-engaging element about the lengthwise axis of the leg.

4,537,375

METHOD AND APPARATUS FOR THRUSTER TRANSIENT CONTROL

Fred N. Chan, Atherton, Calif., assignor to Ford Aerospace & Communications Corporation, Detroit, Mich.

Filed Apr. 21, 1983, Ser. No. 487,364
Int. Cl.³ B64G *1/26*
U.S. Cl. 244—171 **13 Claims**



1. For use in a spacecraft during a change in velocity maneuver, the spacecraft employing a plurality of thrusters, at least a first thruster and a second thruster being disposed to develop mutually counteractive moment arms of thrust relative to at least one axis through a center of mass of the spacecraft, said first thruster and said second thruster being capable of developing unequal moment arms of force, a method for counteracting disturbance transients comprising the steps of:

storing prior to said manuever a value representative of an estimated disturbance torque; thereafter

modulating in response to said stored value one of said first and second thrusters during said maneuver to counteract an actual disturbance torque a sufficient amount to compensate for said actual disturbance torque in order to minimize a net position error without initially detecting said net position error; thereafter

detecting said net position error, said net position error being indicative of a difference between said estimated disturbance torque and said actual disturbance torque with respect to said axis; and thereafter

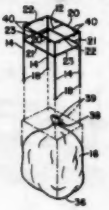
modulating in response to a sum of said stored value and said net position error one of said first and second thrusters during said manuever to counteract said actual disturbance torque to further minimize said net position error.

4,537,376

FRAME FOR HOLDING PLASTIC BAG

Berniece Buku, 6846 Brandt Pike, Apt. A, Huber Heights, Ohio 45424

Filed Oct. 5, 1983, Ser. No. 539,321
Int. Cl.³ A63B *55/04*
U.S. Cl. 248—97 **10 Claims**



1. A structure including a collapsible and rectractable frame to fit inside a plastic bag of a soft, pliable plastic material including polyethylene and the like that is non-self-supporting though initially open at one end closed off when filled as used for gathering leaves, weeds, clippings of grass, bulky materials such as garbage, trash, paper towels and other disposible items, comprising:

four upright corner-side rods spaced from each other in parallel locations and having upper ends as well as lower ends;

four upper rod members interconnecting only upper ends of said upright rods;

four intermediate rod members interconnecting said upright rods only in locations approximately intermediate upper and lower ends of said upright rods; and

double hinge means at eight juncture locations of said four upper rod members and said four intermediate rod members whereby said frame is unfoldable to fit into the plastic bag and foldable into a substantially flat storage configuration, each double hinge means including a pair of central loop portions fitted snugly around said four upright corner-side rods and including therewith projections laterally thereof connected to hold said upper and intermediate rod members therebetween.

4,537,377

BAG HOLDER

W. Donald Shewchuk, 170 Commander Blvd., Agincourt, Ontario, Canada M1S 3C8

Filed Nov. 30, 1984, Ser. No. 676,572
Claims priority, application Canada, Oct. 26, 1984, 466462
Int. Cl.³ B65B *67/04*
U.S. Cl. 248—99 **6 Claims**

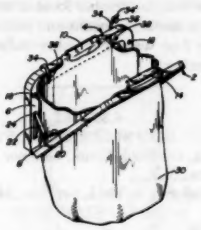
1. A holder for garbage and refuse bags integrally molded of plastic material

comprising front and rear frame members each of inverted U-shape interconnected at the ends of their arms by hinges formed of webs of plastic material permitting relative movement of the frame members from closed contacting position to open position, and having means to secure the frame members in closed contacting position, and and

means on the front and rear frame members to hold a shopping, garbage or refuse bag, and

links molded integrally with the front and rear frame members, one end of each link being pivotally secured to its respective frame member by a plastic hinge web, with the

free ends of the links on the rear frame member being pivotally interconnected with the free ends of respective



links on the front frame member to limit the opening of the frame members.

4,537,378

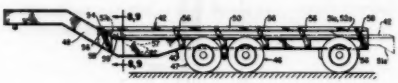
MOBILE STORAGE PLATFORM AND LIFTABLE BED TRAILER

Nick P. Glumac, P.O. Box 327, Kingsbury, Ind. 46345

Continuation of Ser. No. 393,067, Jun. 28, 1982, abandoned, which is a continuation-in-part of Ser. No. 187,349, Sep. 15, 1980, Pat. No. 4,372,514. This application Aug. 9, 1984, Ser. No. 639,188

Int. Cl.³ F16M *11/32*

U.S. Cl. 248—163.1 **5 Claims**



1. In a transport vehicle having a fixed bed and a liftable bed, the fixed bed having means to cause said liftable bed to be moved upwardly from a loading position in which said liftable bed is superimposed thereupon to a raised transport position directly above said superimposed position, the improvement comprising: a plurality of generally equi-length rotary arms pivotally connected at each end thereof respectively to spaced apart portions of said fixed and liftable beds, said rotary arms being capable of swinging from a generally horizontal position in which said beds are superimposed to an overcenter position in which said liftable bed is in its raised transport position, stop means to stop movement of said liftable bed following movement of said rotary arms into said overcenter position, stanchion means connected to the fixed bed, said stanchion means extending generally upwardly and rearwardly, said stanchion means defining bifurcated means for the reception of the forward end of the liftable bed when the liftable bed is in its raised position and means interlocking the bifurcated means and the forward end of the liftable bed.

4,537,379

SHELVING MEANS

Reginald L. Rhoades, Box 165, Hagerstown, Ind. 47346

Filed Mar. 25, 1982, Ser. No. 362,024

Int. Cl.³ E04G *5/06*

U.S. Cl. 248—222.2 **12 Claims**

1. Support means by which a first support member is supported by a second support member,

the second support member being provided with an elongated recess opening to a face of the second support member;

the portion of the first support member supportively engageable with the said recess of the second support member being such that it is insertable freely thereinto, into a first relative position, by first positioning the said portion into the recess, and then, upon applying a twisting force to the outer portion of the first support member about the general axis of the recess, the said engageable portion of the first support member is caused to snugly engage the said recess as the parts are relatively moved thereby to a second relative position of firm support of the first support member by the second support member;

the first support member having a fulcrum portion displaced transversely of the outer portion; and

a connecting portion between said outer portion and said fulcrum portion having a surface adapted to bearingly engage an undercut portion of the said elongated recess.

4,537,380

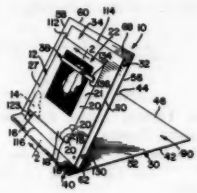
NEEDLEWORK PATTERN BOOKLET HOLDER

Edward C. Erickson, Crete, Ill., assignor to Sales Tools, Inc., Des Plaines, Ill.

Filed Jun. 9, 1983, Ser. No. 502,488

Int. Cl.³ A47B *97/04*

U.S. Cl. 248—460 **10 Claims**



1. A needlework pattern booklet holder comprising:

a front panel and a rear panel,

said panels each being quadrilateral in configuration with each said panel defining parallel side edges along either side of same, inner edges that are in adjacency, and outer free edges,

with said inner and outer edges being disposed generally normal of the respective panel side edges,

said panels further each defining inner and outer side surfacings,

an elongate rigid brace plate located adjacent said inner edges of said panels,

said brace plate comprising two planar sections extending longitudinally of said brace plate and fixed together at a corner adjacent the median portion of said brace plate and disposed at an obtuse angle,

said brace plate having a front side and a back side and said sections being angled at said corner forwardly of said front whereby said brace plate defines an internal apex along said corner at said front side thereof,

with one of said brace plate sections overlying said inner edge of said rear panel in substantial parallelism thereto and along the inner side surfacing thereof with the brace plate back side facing said rear panel inner side surfacing,

and with said inner edge of said front panel being hinged with respect to said brace plate other section along a swing axis that parallels said brace plate corner and that is

spaced therefrom across and at least the width of said brace plate other section,

a mounting panel of quadrilateral shape overlying the inner surfacing of said rear panel and defining opposite side edges paralleling the rear panel side edges, an outer edge that parallels said rear panel outer free edge, an inner edge paralleling said rear panel inner edge, and front and rear side surfacings,

with said mounting panel inner edge overlying said brace plate one section across said brace plate front side thereof,

and means for anchoring said brace plate one section and said mounting panel along said inner edge thereof to said rear panel in the area of said one brace plate section,

with said mounting panel being free of fixed connection to said rear panel between said brace plate one section and said outer edge thereof for forming a quadrilateral holder flap for fold over receiving positioning thereon a pattern booklet optionally from either of said edges or said outer edge thereof,

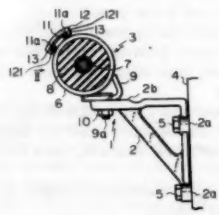
whereby when said front and rear panels of said pattern booklet holder are swung about said swing axis to bring said inner side surfacings in adjacency, said holder is in closed relation over said mounting panel front side surfacing, and when said panels are swung about said swing axis to set said brace plate other section in seated relation against the outside surfacing of said front panel adjacent said inner edge thereof, said holder front panel inner surface may be rested on a horizontal support to dispose said mounting panel and said rear panel in easel forming position for said reception of the pattern booklet across said holder pattern front and rear side surfacings and display of a selected pattern and grid therefor over said mounting panel front side surfacing, with the pattern booklet disposed in one of said positions to orient the horizontal lines of the selected pattern grid substantially horizontally across said mounting panel front side surfacing.

4,537,381

ENGINE MOUNT

Shigeharu Arai, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Dec. 28, 1982, Ser. No. 454,010
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—559 **6 Claims**



1. An engine mount for connecting an engine to a vehicle body, the engine mount comprising:

a bracket having a first surface for connecting the bracket to the engine in a cantilever fashion and a second surface;

an outer rigid tubular member having an axis which is parallel to the second surface;

a first connection means for fixedly connecting the outer rigid tubular member to the second surface of the bracket;

an inner rigid tubular member which is concentric with respect to the outer rigid tubular member;

a first resilient member of tubular shape fixedly arranged between the outer and the inner rigid tubular members;

a second connection means for connecting the inner rigid tubular member to the vehicle body; and

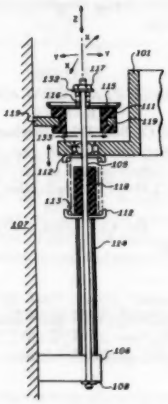
damping means connected to the outer rigid tubular member for achieving resonant frequencies of the mount outside of a predetermined frequency band corresponding to specified types of noises, wherein said damping means comprises a free weight member located at a position opposite to the first connection means and resilient means for connecting the free weight member only to the outer rigid tubular member.

4,537,382

SWAY ROD SUSPENSION SYSTEM

Franklin L. Beck, Guilford, Conn., assignor to Sperry Corporation, New York, N.Y.

Filed Feb. 4, 1982, Ser. No. 345,868
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—568 **19 Claims**



1. A suspension system for an instrument having a frame and vertically supported mounting platform, comprising:

at least three vertically disposed sway rods each fixedly attached at a first end to said frame and pivotally and slidably coupled to said vertically supported mounting platform such that a second end of said sway rods is substantially free to translate in a horizontal plane defined by a pair of orthogonal axes and said mounting platform is substantially free to translate along a vertical axis normal to the horizontal plane;

first means coupled to said frame for limiting translation of said second ends of said sway rods in said horizontal plane;

second means for limiting the translation of said mounting platform along said vertical axis;

third means for damping horizontal translation of said sway rods; and

fourth means for damping vertical translation of said mounting platform.

4,537,383

VALVE

John V. Fredd, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Oct. 2, 1984, Ser. No. 657,009
Int. Cl.³ F16K *31/12*
U.S. Cl. 251—58 **7 Claims**

1. A valve comprising:

a housing having a flowway therethrough;

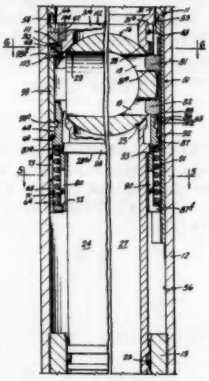
a spherical ball valve member and cooperable seat means;

ball rotation means for rotating said ball valve member between open and closed position including:

a pair of spaced waffle plates formed as segments of a ring with their non-arcuate dimension parallel to said flowway,

said waffle plates having symmetrical, helical intersecting lands and grooves in their interior surfaces,

four cranks rotatably coupled in pairs to opposite spherical sides of the ball valve member,



the cranks of each pair having helical lands and grooves inclined in opposite directions and mating with the lands and grooves of one waffle plate; and actuator means for reciprocating one of said waffle plates and crank pairs in directions parallel to said flowway to rotate the ball valve member between open and closed positions.

4,537,384

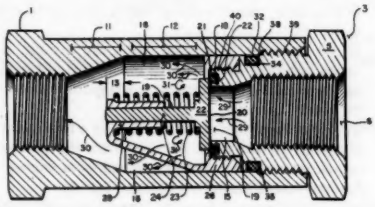
IN-LINE CHECK VALVE HAVING COMBINED DOWNSTREAM POPPET SUPPORT AND FLOW CONTROL ELEMENTS

Oscar J. Petersen, Orange; Ross J. Barton, Costa Mesa; Jack E. Dalke, Whittier; Gerald W. Sheffield, Santa Ana, and Theodore Towle, Huntington Beach, all of Calif., assignors to Brunswick Corporation, Skokie, Ill.

Filed Jul. 17, 1984, Ser. No. 631,594

Int. Cl.[3] **F16K** *31/44, 17/20*

U.S. Cl. 251—83 **7 Claims**



1. In an in-line check valve of the type employing an internal seat, and reciprocating spring biased poppet for preventing reverse flow through said seat, and allowing predetermined forward flow, the improvement comprising;

an in-line housing having an internal concentric orifice;

a seat seal circumferentially surrounding and partially embedded in said seat;

an axially aligned poppet having a seal face cooperating with said seat seal for preventing flow therethrough;

a stem on said poppet;

a poppet support extending downstream from said orifice, defining a poppet guide;

means mounting said poppet stem internal said guide for reciprocating motion therein;

means mounting said poppet support in said housing thereby defining a first relief flow passage downstream said seat and a second flow passage extending therefrom, and a fluid containment chamber for poppet flow and check positions, respectively;

said poppet support extending through said first flow passage and into said second flow passage;

a compression spring concentric said poppet guide and intermediate said seal face and guide;

means on said guide and poppet initially compressing said spring and establishing a predetermined poppet/seal force;

wherein upstream pressure on said poppet seal face in excess of a predetermined value, on overcoming said poppet spring bias, translate said poppet downstream, thereby disengaging said poppet and seal, establishing flow through said passage and around said poppet stem guides.

4,537,385

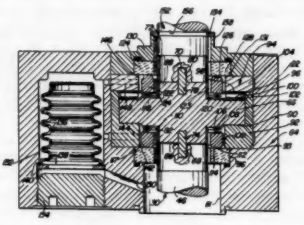
LOW EMISSION VALVE

Duncan D. Bragg, Simi Valley, and Robert S. Wentworth, Temecula, both of Calif., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Oct. 14, 1982, Ser. No. 434,291

Int. Cl.[3] **F16K** *31/44, 37/00*

U.S. Cl. 251—214 **7 Claims**



1. A valve assembly for a fluid system, said assembly having a rotatable stem means connected to a movable member located in a valve housing, said member being movable to control the flow of a product fluid through said housing, and a mechanical seal assembly having contacting seal faces for reducing and substantially preventing the escape of product fluid along said stem means and across said contacting seal faces to the exterior of said valve assembly, said mechanical seal assembly comprising:

a rotor having upper and lower surfaces and connected to said stem means for rotation therewith;

an upper pair of seal rings with contacting surfaces surrounding said stem means, one of said upper seal rings being fixed with respect to said rotor;

a lower pair of seal rings with contacting surfaces surrounding said stem means, one of said lower seal rings being fixed with respect to said rotor;

generally cylindrical bellows connecting the others of said seal rings to said upper and lower surfaces of said rotor and resiliently urging the connected seal rings toward their corresponding fixed seal rings; said bellows each surrounding said stem means and each defining a pair of zones, one zone of which is located interiorly of each bellow and the other zone of which is located exteriorly of each bellow, the exteriorly located zone also being defined by a portion of said rotor;

a source of buffer fluid;

means to supply buffer fluid to each of said exteriorly located zones; and

means controlled by the pressure of said product fluid in said valve housing to pressurize said buffer fluid in one of said exteriorly located zones to a pressure above that in one of

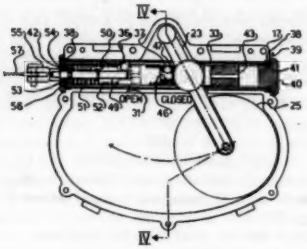
said exteriorly located zones and in the other of said exteriorly located zones to a pressure substantially equal to that in the other of said interiorly located zones.

4,537,386

ENGINE SHUTDOWN VALVE

Josef Krepela, and Jaromir Friedrich, both of Edmonton, Canada, assignors to Bralorne Resources Limited, Canada

Filed Sep. 22, 1982, Ser. No. 421,062
Int. Cl.³ F16K 1/16
U.S. Cl. 251—302 **20 Claims**



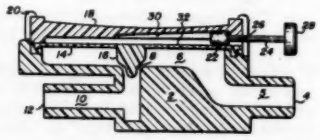
1. An engine shutdown device adapted to be inserted in the induction manifold of an engine and comprising a substantially circular gate valve movable within a valve housing about an axis between open and closed positions, a gate lever between said gate valve and said axis, latching means to hold said valve and lever in said open position, release means to release said latching means, and movement means acting on a portion of said gate lever to move said valve and lever between said open and said closed positions, said latching, release and movement means being positioned in a latch housing located exterior of and substantially immediately adjacent to said valve housing and said induction manifold, said latch housing having a generally cylindrical cross-sectional configuration with a diameter generally approximating the width of said shutdown device between its upstream and downstream faces, said gate lever passing through said latch housing, and said gate lever portion being aligned with said release, latching and movement means within said latch housing.

4,537,387

PRECISION VALVE ASSEMBLY

Hal C. Danby, Palo Alto, and Werner W. Clupke, San Mateo, both of Calif., assignors to Anatros Corporation, San Jose, Calif.

Filed Sep. 30, 1982, Ser. No. 431,311
Int. Cl.³ F16K 7/12
U.S. Cl. 251—331 **7 Claims**



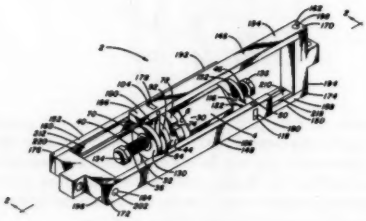
1. A precision valve assembly comprising first and second valve elements, one of which is a valve and the other is a valve seat aligned therewith, the first valve element being joined to a diaphragm having first and second opposite surfaces and movable therewith, the first valve element projecting from the first surface of the diaphragm, an adjustable actuation means contacting the second surface of the diaphragm between the axis of the valve element and adjacent the edge of the diaphragm for flexing the diaphragm and displacing the first valve element toward the second valve element, a backstop means facing the second surface of the diaphragm and the actuator means positioned in contacting engagement between the backstop means and the second surface of the diaphragm, whereby movement of the actuator means pressing the surfaces of the diaphragm and backstop means apart flexes the diaphragm in a direction away from the backstop means and displaces the first valve element toward the second valve means, wherein the backstop means is less flexible than the diaphragm but sufficiently flexible to relieve pressure on the diaphragm resulting from actuator movement continued after the first and second valve elements are maximally closed.

4,537,388

ADJUSTABLE TENSIONING DEVICE

Francis B. McCabe, 38 Cedar St., Everett, Mass. 02149

Filed May 14, 1982, Ser. No. 378,215
Int. Cl.³ F16B 7/06
U.S. Cl. 254—232 **20 Claims**



1. A device for drawing together two members, the device comprising:

anti-separation means;

a first member attached to the anti-separation means;

a second member attached to the anti-separation means;

the anti-separation means intermediate the first and second member;

first moveable means adjustably engaged with the first member;

second moveable means adjustably engaged with the second member;

a third member associated with the first moveable means whereby movement of the first moveable means on the first member causes corresponding movement of the third member;

a fourth member associated with the second moveable means whereby movement of the second moveable means on the second member causes corresponding movement of the fourth member;

a first attachment means for connecting a first member to be tensioned to the third member with the anti-separation means intermediate the first attachment means and the first moveable means;

a second attachment means for connecting a second member to be tensioned to the fourth member with the anti-separation means intermediate the second attachment means and the second moveable means, whereby movement of the first moveable means results in corresponding movement of the first attachment means and first attached member to be tensioned and movement of the second moveable means results in corresponding movement of the second attachment means and second attached member to be tensioned thereby varying tension on the attachements to the first and second attachment means and the anti-separation means intermediate the first moveable means and first attachment means as well as the second moveable means and the second attachment means precluding separation of

the device if either the first or second moveable means fails.

4,537,389

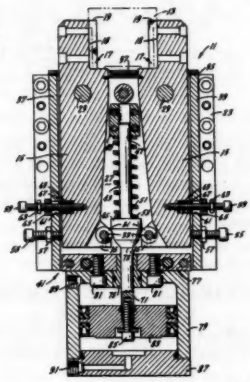
MACHINE TOOL FIXTURE

Adolph V. Kancnik, Glenview, and Kenneth A. Klancnik, Palatine, both of Ill., assignors to Universal Automatic Corporation, Des Plaines, Ill.

Filed Dec. 27, 1983, Ser. No. 565,292

Int. Cl.³ B23Q *3/08*

U.S. Cl. 269—34 **4 Claims**



1. A fixture for holding and presenting a work piece to a tool and including:

a pair of pivotally mounted elongated arms,

said arms at one end each having a jaw for closing on and engaging the work piece,

said arms being disposed between a pair of opposed plates,

rollers mounted on the arms adjacent the opposite ends thereof,

a tapered rod extending between the rollers with the narrow part thereof engaging the rollers when the jaws are in their open position,

spring means biasing the tapered rod to dispose the wider portion of the rod in the space between the rollers to cause the jaws to close, and

a fluid actuated piston attached to the tapered rod and movable by the fluid alternately to assist or oppose the bias of the spring.

4,537,390

HIGH SPEED FOLDER FLY

Roberto C. Kiamco, Wood Dale, and Eugene Skipor, Jr., Palos Hills, both of Ill., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Jun. 14, 1984, Ser. No. 620,649

Int. Cl.³ B42B *1/02*

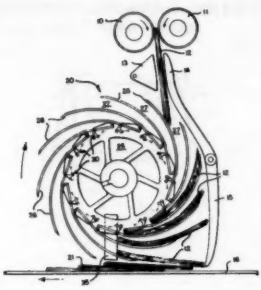
U.S. Cl. 270—53 **6 Claims**

1. A high speed rotary fly for receiving newspapers from a folder and despositing them in imbricated form on a conveyor apparatus, said fly comprising:

(a) a central fly hub;

(b) a plurality of fly fingers attached to said fly hub and extending outwardly therefrom in arcuate, overlapping relationship to form pockets into which newspapers are received; and

(c) yieldable means pivotally attached to said fly hub extending across the bottom portion of each pocket to prevent



the newspaper from bouncing when it reaches the pocket bottom.

4,537,391

ROTARY COLLATING AND/OR INSERTING MACHINES AND METHOD OF COLLATING AND/OR INSERTING SHEET MATERIAL

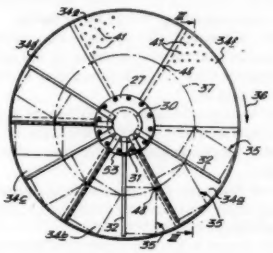
Christopher R. Watkiss, and Michael C. Watkiss, both of Biggleswade, England, assignors to Watkiss Automation Limited, Bedfordshire, England

Filed Dec. 22, 1982, Ser. No. 452,182

Claims priority, application United Kingdom, Dec. 24, 1981, 8138992

Int. Cl.³ B65H *3/08*

U.S. Cl. 271—101 **22 Claims**



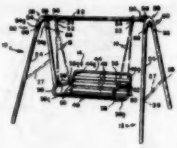
8. A rotary machine comprising a table for receiving a plurality of stacks of sheets of material spaced at intervals around a circle centered on the axis of rotation of the machine, means providing for relative rotational movement between the table and the stacks, the table defining at least one substantially radial slot down through which sheets separated from the bottom of the respective stacks are arranged to pass, suction means provided within the contour of a table section to create changes in air pressure at the upper trailing edge region of the table section to exert a suction effect on the bottom sheet of each stack, control means for said suction means operative to cause cyclic variations in the suction effect generated by said suction means on the sheets during the period from initial separation of a bottom sheet from a stack to completion of the movement of the sheet down through a slot whereby the suction effect is terminated after initial separation of a bottom sheet from a stack and before completion of movement of the sheet down through the slot.

4,537,392

FOLDABLE SWING SET

William L. Defibaugh, Bedford, Mass., assignor to Brown Group Recreational Products, Inc., Bedford, Pa.

Filed Jun. 6, 1984, Ser. No. 617,892
Int. Cl.[3] A63G *9/00*
U.S. Cl. 272—85 **4 Claims**



1. In a foldable swing set of the type including a support frame composed of a crossbar, a pair of suport legs connected to each of the opposite ends of the crossbar, a swing seat and means for suspending the seat from the crossbar, the improvement wherein the connection of each pair of legs to the crossbar comprises

A. a bracket composed of a substantially inverted U-shaped tubular member defining a pair of sockets at its opposite ends sized to slidably receive upper end portions of the associated pair of legs;

B. means for attaching said tubular member between its ends to the corresponding end of the crossbar;

C. a pair of diametrically opposite ears extending beyond each end of said tubular member on the opposite sides of the associated leg for a distance that is no less than the radius of said leg;

D. a pair of aligned holes in each pair of ears, the line between each said pair of holes being spaced from and substantially perpendicular to the longitudinal axis of said crossbar;

E. a pair of diametrically opposite longitudinal slots in each said leg upper end portion, said slots being aligned with said ear openings; and

F. fastener means extending through said ear holes and slots at each bracket socket so as to slidably and rotatively connect each leg to its socket whereby each leg can be moved between a first position in which the upper end portion of said leg is telescopically received in the associated socket with the leg lying generally perpendicular to the crossbar and a second position wherein said leg portion is withdrawn from its said socket with the leg lying generally parallel to the crossbar.

4,537,393

NECK EXERCISER

Richard J. Kusch, Box 205, Pewaukee, Wis. 53072

Filed Jun. 8, 1983, Ser. No. 502,189
Int. Cl.[3] A63B *21/12, 21/16*
U.S. Cl. 272—94 **1 Claim**

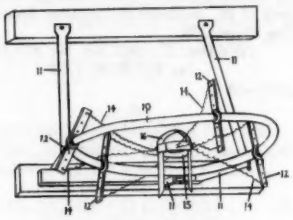
1. A device for exercising various muscles of the human body, especially the neck muscles, said exercise device comprising:

a ring;

a plurality of support brackets attaching said ring to a wall to support said ring in a plane substantially parallel to the floor;

a plurality of bracket members rotatably mounted on said ring at approximately equal intervals;

harness means adjustable to fit the head of the person exercising, said harness means being positioned approximately in the center of the diameter of said ring;



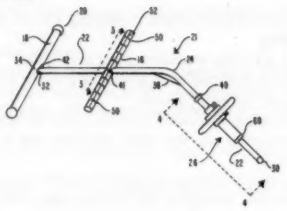
a plurality of springs, each of which attaches at one end to one of said rotatably mounted bracket members and attaches at the opposite end to said harness means, said springs providing resistance against which exercises can be performed.

4,537,394

EXERCISE APPARATUS FOR DEVELOPING ARM AND WRIST MUSCLES

Joseph J. Golinsky, Jr., 357 Henry St., Hellertown, Pa. 18055

Filed Oct. 17, 1983, Ser. No. 542,679
Int. Cl.[3] A63B *21/06*
U.S. Cl. 272—117 **17 Claims**



1. An exercise apparatus for wrists and arms comprising:

(a) a generally longitudinal angled bar said angle located proximate said bar's midpoint;

(b) an elongated arm brace of a length sufficient to span the distance between a user's outwardly extended forearms, said brace mounted perpendicularly on and to said longitudinal bar's proximal end at said arm brace's midpoint;

(c) a transverse crossbar slidably mounted on said longitudinal bar parallel to said arm brace and between said proximal end of said longitudinal bar and said bar's angle, said crossbar adapted to receive handles;

(d) a carriage assembly slidably mounted on said longitudinal bar between said longitudinal bar's angle and said distal bar end, said assembly adapted to receive supplemental weights;

(e) two adjustable, mushroom-shaped handles, each handle including:

(i) a stem;

(ii) a generally flat circular head on one stem end, said head having a stem-aligned aperture and at least one radial aperture; and,

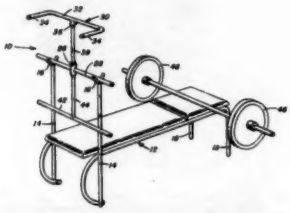
(iii) a handle locking assembly adapted slidably and rotatably to circumscribe said crossbar, said lock including two pins intended to mate with said apertures of part (ii) to adjustably lock said handle in a multitude of radial positions, one position at a time.

4,537,395

EXERCISE DEVICE

Gene A. Spinelli, 1541 Circle La., Newman, Calif. 95360

Filed Nov. 2, 1983, Ser. No. 547,846
Int. Cl.³ A63B *13/00*
U.S. Cl. 272—123 **12 Claims**



1. An exercise device particularly adapted for use in conjunction with exercise apparatus including a pair of spaced upwardly opening support saddles to which the exercise device is freely introduced, and a stable structure below the saddles for free abutment of the exercise device thereagainst; said exercise device comprising an elongated base member adapted for free reception in spaced upwardly opening support saddles, a support comprising an elongated post including a lower end rigid with said base member at an intermediate point therealong, said support post projecting vertically upward from said base member and terminating at an upper end, a handle, said handle comprising a cross-member fixed to the upper end of the support post, said cross-member generally paralleling said base member and terminating in opposed ends, said handle further including gripping arms rigid with said opposed ends of said cross-member and projecting laterally of said cross-member in spaced parallel relation to each other, and a stabilizer, said stabilizer comprising an elongated stem rigid with said base member at an intermediate point therealong and terminating in a lower end, said stabilizer further including a cross-member fixed to the lower end of the stem and extending parallel to said base member generally coextensive therewith, and in vertically spaced relation therebelow for free engagement against a stable structure, said base member, support, handle cross-member and stabilizer defining a common plane, said gripping arms projecting laterally of said plane.

4,537,396

ENERGY ABSORBER FOR EXERCISING MACHINES

Lindsay A. Hooper, Victoria, Australia, assignor to Repco Ltd., Melbourne, Australia

Filed Jun. 23, 1983, Ser. No. 507,145
Claims priority, application Australia, Jun. 24, 1982, PF4580
Int. Cl.³ A63B *21/00, 31/00, 69/06*
U.S. Cl. 272—130 **14 Claims**

1. An energy absorber module for an exercising machine, including:

a frame;

a face board secured to said frame;

a fan housing secured to said frame;

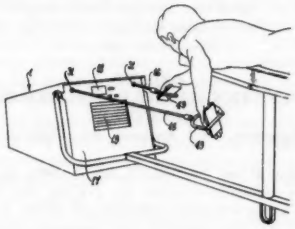
an energy absorber in the form of an air displacement fan rotatably mounted within said housing;

a pair of drive drums rotatably mounted on said frame in axially spaced relationship, wherein each said drum is stepped to form two sections of different diameter;

a drive connection between said drums and said fan, at least one clutch in said drive connection and being operable to transmit drive from said drums to said fan only when said drums are rotating in one direction relative to said frame;

a pair of pull cords each extending beyond said face board and each connected to a respective first diameter section of each said drum and having a portion wound thereupon in a rest position of the drum so that tension applied to each said cord, to cause unwinding movement thereof, causes rotation of said drum in said one direction;

a pair of return cords, each of which is attached to a respective second diameter section of each of said drums and arranged to be wound thereupon during rotation of the drums in said one direction; and



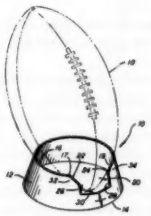
spring means comprising two lengths of elastic shock-cord, each of which is attached to said frame and to a respective said return cord and being operable upon release of tension in said pull cords to unwind said return means from said drums to thereby cause rotation of said drums in the direction opposite to said one direction.

4,537,397

FOOTBALL KICKING TEE

Harold W. Kopp, 137 Daytona Ave., R.R. 6A, Narragansett, R.I. 02882

Filed Dec. 1, 1982, Ser. No. 445,825
Int. Cl.³ A63B *67/00*
U.S. Cl. 273—55 B **5 Claims**



1. In the placement kicking function of the sport of football, the combination comprising:

(a) a regulation size and weight football of substantially ellipsoidal shape having bluntly pointed ends;

(b) a tee supporting said ball above ground level to be met by the foot of a kicker;

(c) said tee consisting essentially of a continuous wall member configured as a truncated cone having a central axis and tapering inwardly from a lower, ground engaging end lying in a flat plane to an open, upper, ball supporting end;

(d) said ball supporting end comprising an upper edge of said wall extending in a segment of a circle for a perimetral distance of between about 220° and 300°;

(e) said ball resting upon said edge and supported by said wall with one of said pointed ends extending not greater than a predetermined maximum distance into said cone, whereby said end is at least a predetermined minimum distance from said flat plane;

(f) said wall member including a cut-out section extending from the ends of said edge of said ball supporting end toward said ground engaging end for a distance at least as great as said maximum distance, whereby said ball may be

kicked from said tee with said one end of said ball passing through said cutout section without substantial interference; and

(g) said wall member being formed entirely of a material which is easily deformable in directions transverse to said central axis, thereby presenting virtually no resistance to the foot of a kicker impacting upon said tee, and sufficiently rigid in the direction of said central axis by virtue of said truncated one configuration to support said regulation weight ball upon said ball supporting end.

4,537,398

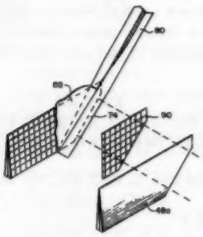
HOCKEY STICK HAVING LAMINATED BLADE STRUCTURE

Reijo K. Salminen, 1842 Academy Rd., Bellingham, Wash. 98225

Continuation of Ser. No. 300,123, Sep. 8, 1981, abandoned, which is a continuation of Ser. No. 171,126, Jul. 22, 1980, abandoned, which is a continuation-in-part of Ser. No. 56,421, Jul. 10, 1979, Pat. No. 4,369,970. This application Jan. 13, 1983, Ser. No. 457,742

Int. Cl.³ A63B *59/12*

U.S. Cl. 273—67 A **3 Claims**



1. A game stick, such as a hockey stick, comprising:

a. an elongate handle member having an upper end and a lower end;

b. a blade member with a lengthwise axis and a heel portion attached to said handle member, said blade member having at least two laminations, with at least one lamination having a grain orientation generally slanted with respect to the lengthwise axis of the blade member;

c. said blade member comprising two blade sections and hardened filler material with heel portions of the blade sections being positioned on opposite sides of the lower portion of the handle member, and toe portions of the two blade sections extending outwardly from the handle member and joined to each other, and the filler material being located in an area between the blade sections, and hardened to form with the blade sections the blade of the stick.

4,537,399

GRIP FOR A RACKET, ESPECIALLY A TENNIS RACKET

Günter Adam, Straubing, Fed. Rep. of Germany, assignor to Puma-Sportschuhfabriken Rudolf Dassler KG, Fed. Rep. of Germany

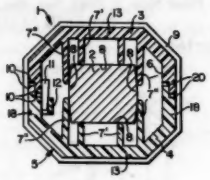
Filed Jul. 3, 1984, Ser. No. 627,512

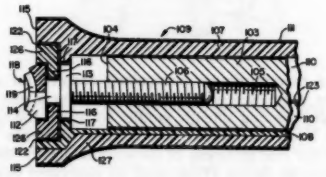
Claims priority, application Fed. Rep. of Germany, Jul. 5, 1983, 3324145

Int. Cl.³ A63B *49/08*

U.S. Cl. 273—75 **22 Claims**

1. A hand-grip for a racket of the type having a hand-grip sleeve formed of longitudinally extending components joined together about a shaft of the frame of the racket which is connected to a hitting surface, wherein the hand-grip sleeve comprises at least two, at least similar, shell parts made of a hard, elastic material, said shell parts having longitudinally extending edge portions which are arranged in such a way that, when they are formed into said hand-grip sleeve and the hand-grip sleeve is applied firmly against the shaft, adjacent end faces of said edge portions don't abut against one another,





and wherein the hand-grip sleeve is provided with an elastic covering which presses it onto the shaft on all sides.

4,537,400

RACKET GRIP HAVING A GRIP STRIP

Günter Adam, Straubing, Fed. Rep. of Germany, assignor to Puma-Sportschuhfabriken Rudolf Dassler KG, Fed. Rep. of Germany

Filed Jul. 3, 1984, Ser. No. 627,526

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1983, 3324144

Int. Cl.³ A63B *49/08*

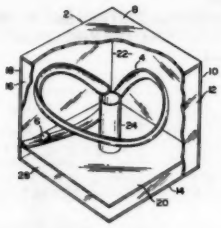
U.S. Cl. 273—75 **28 Claims**

1. A racket handle of the type having a grip strip fastened at the bottom end of a hand-grip of the racket handle, wherein the bottom end of the hand-grip is provided with a slot that projects inwardly from one side of the hand-grip, and opens through a bottom wall of the hand-grip an end of a grip strip being insertable edgewise into said slot through said bottom wall, and wherein means, comprising a structural part of said hand-grip, is provided for holding said end of the grip strip in co-action with a tensional pulling effect of winding of the grip strip about the periphery of said hand-grip.

4,537,401
GAME APPARATUS

Roger D. Smith, 2705 S. Sunshine Dr., Lakeland, Fla. 33801, and Harold J. Baer, 6597 Lake Elmo Ave., N., Stillwater, Minn. 55082

Filed Dec. 22, 1983, Ser. No. 564,564
Int. Cl.³ A63B 67/14
U.S. Cl. 273—112 27 Claims



1. A game apparatus comprising

a manipulatable container having a first compartment, said first compartment having a plurality of sides;

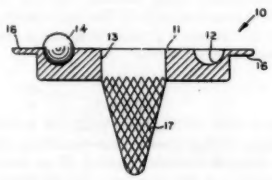
track means comprising a first sinuous track mounted within said first compartment and having a concave surface of predetermined width and depth said track beginning at a first starting point and ending at a first finishing point spaced from said first starting point and describing a three-dimensional path extending between said points, and said track including a longitudinal twist between said first starting point and said first finishing point such that a line perpendicular to said track surface at its maximum depth at one point along said track extends in a direction generally perpendicular to the direction of a similar line at another point along said track; and

a first ball of predetermined diameter adapted to be received onto said concave surface of said track and to roll along said track means.

4,537,402
METHOD OF PLAYING A MOVING SURFACE BALL GAME

Herbert W. Prather, Jr., R.D. #3, Station Rd., North East, Pa. 16428

Filed Oct. 14, 1980, Ser. No. 196,444
Int. Cl.³ A63F 7/00
U.S. Cl. 273—116 1 Claim



1. The method of playing a game including: providing an apparatus which comprises,

a platform having a round flat planar top upper surface terminating in a flat outer edge,

an endless annular groove in the upper surface,

handle means attached to each side of the platform,

a ball approximately the size of a tennis ball for engaging said groove and being guided along said groove along the upper surface of the platform and to be moved by gravity when the platform is manually tilted,

the groove being generally semi-circular in cross section and having a radius slightly larger than the radius of the ball and a depth approximately equal to the radius of said ball,

a central cylindrical hole formed in the platform and extending therethrough and terminating at said flat planar surface concentric to said groove and at the center thereof,

the hole being at least as large in diameter as the cross-section diameter of the groove,

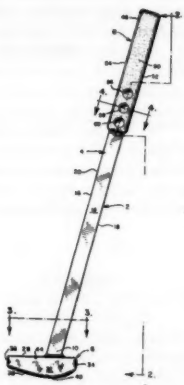
a generally cylindrical net being attached to the platform around the inner periphery of the hole and extending downward below the hole for catching balls that may roll out of the groove to the center when the platform velocity of the ball and rate of tilting is improperly coordinated,

grasping the handle means by the hands of an operator at two diametrically opposite positions and tilting the platform rapidly from side to side, thereby causing the ball to roll around the groove at a maximum velocity and to fall off said outer edge if rolled greater than said velocity or to roll into said net under said improper coordination, the rounds of travel of said ball in a given time being counted to determine the score of said player before said ball rolls over the outside edge of said groove or into said net, thereby terminating a turn of said player.

4,537,403
GOLF CLUB

John Farina, 2228 W. Belmont, Chicago, Ill. 60618

Filed Nov. 21, 1983, Ser. No. 553,584
Int. Cl.³ A63B 53/14
U.S. Cl. 273—164 3 Claims



3. A putter golf club having a shank and a head at one end and a flat handle at the other end all located in a common plane, and said head having ballstriking faces at opposite sides thereof and said handle having parallel sides coplanar with respective faces of the head, and stroke-gauging means formed in said sides of the handle comprising a series of indents spaced lengthwise of the handle and being concavely shaped.

4,537,404
BROADHEAD ARROW HEAD STRUCTURE

Gary M. Castellano, 527 Elizabeth Ave., Grand Rapids, Minn. 55744, and Kenneth W. Alto, Rte. 2, Bovey, Minn. 55709

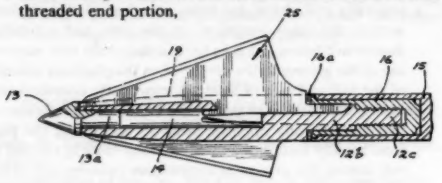
Filed Dec. 19, 1984, Ser. No. 683,607
Int. Cl.³ F41B 5/02
U.S. Cl. 273—422 7 Claims

1. A broadhead arrow head assembly for attachment to an arrow shaft, having in combination

a substantially cylindrical body portion having a tip portion,

a bore extending inwardly of said body portion from said tip portion,

a plurality of longitudinal slots spaced about said body portion,
rearward portions of said slots extending deep enough into said body portion to communicate with said bore,
a further rearward extension of said body portion having a threaded end portion,
a shaft having means in one end thereof to receive said threaded end portion,



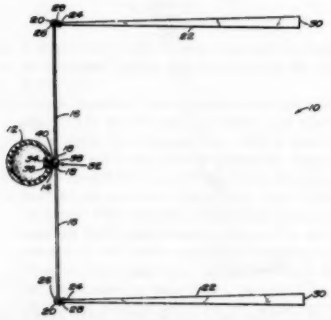
blade members disposed into said slots,
said blade members respectively having elongated forwardly extending tongue portions,
said tongue portions entering said bore and underlying the adjacent body portion to be secured therein, and
a shaft having means in one end thereof receiving said threaded end portion and engaging and locking said blade members in operating position.

4,537,405

AERIAL RECREATION DEVICE

Murray J. Cymbler, East Meadow, N.Y., assignor to The Astro-Stream Corporation, East Meadow, N.Y.

Filed Nov. 13, 1984, Ser. No. 670,183
Int. Cl.³ A63B *65/00*
U.S. Cl. 273—428 **14 Claims**



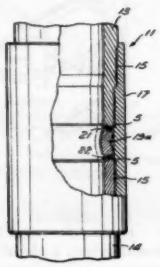
1. An aerial recreation device, comprising:
a weighted head;
two or more, elongated, flexible arms that are resilient when bent; each arm having a first end and a second end at its opposite ends; the first ends of the arms being connected to the head; the second ends of the arms extending laterally away from one another and from the longitudinal axis of the device and extending laterally beyond the head; and
two or more, light and flexible, elongated tails; each tail having a first end and a second end at its opposite ends; the first end of each tail being connected to the second end of one of the arms; the arms and tails being adapted so that: (1) the second ends of the arms move laterally closer to one another and to the longitudinal axis of the device when the second ends of the tails are grasped together and the head is swung about the grasped second ends of the tails; and (2) the second ends of the arms move laterally apart, away from the longitudinal axis of the device and beyond the head, after the grasped second ends of the tails are released to propel the device through the air.

4,537,406

HOSTILE ENVIRONMENT JOINT SEAL AND METHOD FOR INSTALLATION

Alan R. Hirasuna, Newport Beach, and Gordon R. Veal, Mission Viejo, both of Calif., assignors to L'Garde, Inc., Newport Beach, Calif.

Filed Apr. 27, 1983, Ser. No. 489,244
Int. Cl.³ F16L *33/24*
U.S. Cl. 277—1 **44 Claims**



15. A method for providing a gas and fluid-tight seal for a joint comprising:
fabricating a backup member out of a shape memory material;
forming said backup member in a suitable memory shape to effect a sealing between sealing surfaces of the joint;
fabricating a sealing member out of a compliant material;
installing the sealing member on a sealing surface of the backup member in a manner whereby a continuous portion of the sealing surface remains exposed adjacent the installed sealing member;
deforming the backup member to an intermediate shape that provides clearance between the sealing surfaces of the backup member and the sealing surfaces of the completed joint;
placing the intermediate shape backup and sealing member assembly in the joint prior to the mechanical completion thereof;
completing the mechanical or structural formation of the joint; and
heating the intermediate shape backup member present in the completed joint sufficiently to cause transformation of the intermediate shape backup member to its memory shape, and thus formation of the seal whereby the exposed portion of the sealing surface forms a backup for the compliant sealing member.

4,537,407

APPARATUS FOR TESTING PIPES BY A PIPE TESTER

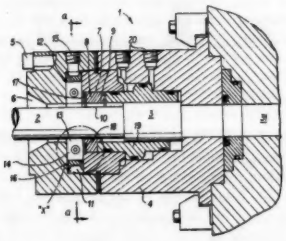
Herbert Jansen, Glehn; Hans-Gunter Schiffers, Monchen-Gladbach, and Richard Gerretz, Viersen, all of Fed. Rep. of Germany, assignors to Mannesmann Demag Wean, Coraopolis, Pa.

Filed Feb. 28, 1984, Ser. No. 584,372
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1983, 3307813
Int. Cl.³ F16J *15/12*
U.S. Cl. 277—2 **12 Claims**

1. In a sealing assembly for a pipe tester or the like, in which fluid under pressure is introduced into the interior of the pipe and the ends of the pipe are sealed, comprising:
a housing having an aperture for receiving said end of said pipe,
sealing ring means in said aperture through which said pipe

is caused to pass, constructed in a manner to be deformable in opposite axial directions and radially towards and away from said pipe such that when deformed it will contact the external circumference of said pipe to form a sealing condition,

supporting ring means arranged concentric to said pipe and adjacent said deformable sealing ring and to one side thereof, and constructed in a manner to contact said external circumference of said pipe and to control the extent of said deformation of said sealing ring means in a said axial direction on said one side when said sealing ring means is deformed,



means for introducing pressure against said support ring means to effect its said contact against said pipe and said deformation of said sealing ring means, and

forming means arranged in said aperture adjacent to and on both sides of said sealing ring means in a manner to cause said sealing ring means when deformed to be displaced in said opposite axial directions with respect to said pipe, and to create a sealing surface substantially larger in said deformed condition than in said non-deformed condition of said sealing ring means.

4,537,408

DEVICE FOR APPLYING SURFACE PRESSURE TO ADVANCING WORKPIECES

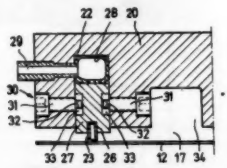
Werner Pankoke, Bielefeld, Fed. Rep. of Germany, assignor to Firma Theodor Hymmen KG., Bielefeld, Fed. Rep. of Germany

Filed Apr. 11, 1984, Ser. No. 598,948

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1983, 3313406

Int. Cl.³ F16J *15/46*

U.S. Cl. 277—34 **10 Claims**



1. In a device for applying surface pressure to workpieces advancing on at least one movable compression belt, means for forcing the workpiece against the belt including a pressure chamber adjacent to the belt and a hose therein receptive of a pressure medium and a continuous sealing strip between the pressure chamber and belt for sealing off the pressure chamber and means mounting the strip such that the belt slides thereabout, including a pressure plate having a groove and a holder in the groove, the improvement wherein the means mounting the strip further comprises at least one lateral recess positioned in the holder transversely to its length and to the surface of the belt connected to the pressure plate and having means disposed in the recess.

4,537,409

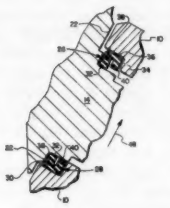
RADIAL ROCK BIT SEAL

Roy D. Estes, Weatherford, and Beaumont B. Wright, Fort Worth, both of Tex., assignors to Rock Bit Industries U.S.A., Inc., Fort Worth, Tex.

Filed Mar. 22, 1984, Ser. No. 592,182

Int. Cl.³ F16J *15/24*

U.S. Cl. 277—83 **21 Claims**



1. A rotary seal for utilization with an earth boring drill bit having a drill bit body with a shaft rigidly mounted on a face surface thereof and a rolling cutter rotatably mounted on such shaft, said seal comprising:

a circular seal body adapted to be mounted around said shaft, said circular seal body including;

a first seal portion having a first elastomeric surface in sealing and sliding engagement with said shaft;

a second seal portion axially displaced from said first seal portion with respect to said shaft, having a second elastomeric surface in sealing and sliding engagement with said rolling cutter; and

a flexible juncture joining said first seal portion and said second seal portion wherein displacement of said rolling cutter will have minimal effect on said sealing and sliding engagement of said first elastomeric surface with said shaft.

4,537,410

ARRANGEMENT FOR SUPPLYING A CHUCK WITH PRESSURE FLUID

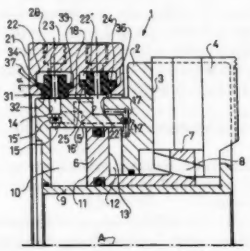
Karl Hiestand, Pfullendorf, Fed. Rep. of Germany, assignor to SMW Schneider & Weisshaupt GmbH, Fed. Rep. of Germany

Filed May 23, 1984, Ser. No. 613,288

Claims priority, application Fed. Rep. of Germany, May 27, 1983, 3319228

Int. Cl.³ B23B *31/30*

U.S. Cl. 279—4 **16 Claims**



16. In a pressure fluid supply arrangement for chucks including a chuck body having a longitudinal axis, a pressure proof

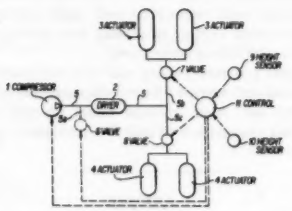
connection for transferring pressure fluid radially from a fixed supply ring to chuck parts in the chuck body to be temporarily moved, with an annular seal ring being inserted in the supply ring so as to surround a circumferential surface of the chuck body, which seal ring is elastically deformable to vary its diameter and, in an unload state, is in a position slightly spaced from the circumferential surface of the chuck body, the improvement comprising: the seal ring being formed of a ring body portion having a substantially rectangular cross section and being stable in its shape, cross sectional shape, and in which at least one flow passage for the pressure fluid is provided; a pair of fins formed on said ring body portion which projects from the opposite body surfaces of said ring body portion that are perpendicular to the longitudinal axis of the chuck body, about in a middle of said ring body portion; said fins being radially elastically deformable and bearing against the supply ring; said seal ring in the unloaded state being biased to sealingly apply against a peripheral inner surface of an annular groove provided in the supply ring; and said sealing ring having a radially outer seal ring surface parallel to the axis of the chuck body and exposable to the inflowing pressure fluid which has a larger area than a radially inner seal ring surface of said sealing ring to be exposed to the pressure fluid during and upon pressure fluid transfer.

4,537,411

VEHICLE BODY POSITION CONTROL SYSTEM

Yuichi Naramoto, Chiryu, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 13, 1983, Ser. No. 531,746
Claims priority, application Japan, Sep. 13, 1982, 57-159081
Int. Cl.³ B60G *9/00*
U.S. Cl. 280—6 R **4 Claims**



1. A vehicle body position control system, comprising:

first and second actuator means operated by a pressurized air for generating vertical movement of said vehicle body;

air compressor means for supplying said pressurized air to said first and second acutator means;

air passage means interconnecting said compressor means and said first and second actuator means;

air dryer means, including a desiccating agent disposed therein, being positioned within said air passage means between said compressor and said first and second actuator means;

said air passage means having a first branch passage leading therefrom between said compressor means and said dryer means, said first branch communicating with the atmosphere;

first solenoid valve means positioned within said first branch passage;

second solenoid valve means in said air passage means between said dryer means and at least one of said first and second actuator means;

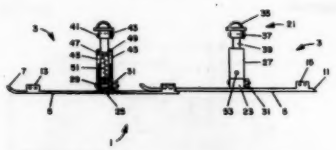
control means for controlling operation of said first and second solenoid valve means and said compressor meand, said control means including delay means for opening said second solenoid valve means with a delay of a predetermined time after opening said first solenoid valve means, to thereby release said pressurized air within said at least one of said first and seocnd actuator means into the atmosphere through said dryer means.

4,537,412

MULTI-SEASON SKI SLED

Walter F. Hill, P.O. Box 116, Crown Point, N.Y. 12928

Filed Aug. 6, 1984, Ser. No. 638,121
Int. Cl.³ A63C *5/02*
U.S. Cl. 280—7.12 **3 Claims**



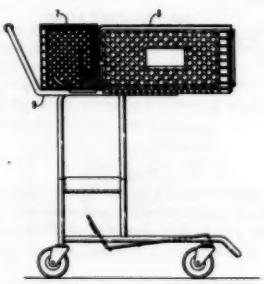
1. A ski sled for skiing and sledding, comprising identical and interchangeable ski members for assembling said ski members in tandem relationship, or for assembling said ski members in side-by-side relationship, or for assembling said ski members in a combination of both tandem and side-by-side relationships; each ski member having a seat assembly for a rider, each ski member having a fore or toe end and an aft or rear end, each ski member having forward or toe and rear or heel brackets at said fore and aft ends, respectively, and in the assembly of said ski members in tandem relationship: one of said ski members being a leading ski member and the other of said ski members being a trailing ski member, and said forward bracket on said trailing ski member being connected to said rear bracket on said leading ski member; and said ski members having coupling means for connecting said ski members in side-by-side relationship.

4,537,413

PLASTIC BASKET FOR USE WITH A CART HAVING FRONT AND REAR BASKETS

B. Houston Rehrig, 4539 Gorham St., Corona Del Mar, Calif. 92625

Filed May 9, 1983, Ser. No. 492,631
Int. Cl.³ B62B *3/00*
U.S. Cl. 280—33.99 B **8 Claims**



8. A plastic rear basket for use with a cart having separate front and rear baskets, said cart having a horizontal frame portion to which the baskets are attached, said plastic basket comprising:

a pair of opposed side panels, a rear panel, and a bottom panel attached together along their contiguous edges, said side panels and said bottom panel terminating in a front edge;

a seat back panel pivotally attached to said side panels and

supported by said bottom panel at the front portion of said rear basket;

a child's seat pivotally attached to said bottom panel at the rear portion of said basket;

said rear panel comprising at least one leg opening for accommodating the legs of a child sitting on said child's seat, said child's seat adapted to be movable between a first position in juxtaposition to said bottom panel and a second position covering said leg opening;

said seat back panel being movable between a first seat back position substantially perpendicular to said bottom panel and a second seat back position in juxtaposition to said bottom panel; and

a lifting bar adapted to move said child's seat to said first position in juxtaposition to said bottom panel when said seat back panel is moved to said seat back position substantially perpendicular to said bottom panel and to move said child's seat to said second position covering said leg opening when said seat back panel is moved to said seat back position in juxtaposition to said bottom panel, wherein said bottom panel comprises hinge means integral to said bottom panel and said child's seat comprises a hinge member for hingedly engaging said hinge means for moving said child's seat between said first position in juxtaposition to said bottom panel and said second position covering said leg opening and wherein said hinging means integral to said bottom panel comprises recessed sections including a flexible member which can be elevated for receiving said hinge member.

4,537,414

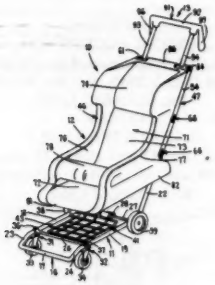
COMBINATION CAR SEAT AND STROLLER

Ronnie W. Nusbaum, 68640 Balk Rd., Sturgis, Mich. 49091

Continuation-in-part of Ser. No. 293,116, Aug. 17, 1981, abandoned. This application Mar. 21, 1983, Ser. No. 477,283

Int. Cl.³ B62B 7/10

U.S. Cl. 280—47.41 **9 Claims**



1. A child seating device adapted for use as a protective car seat and as a stroller, comprising:

a child support having a seat member for a child, said seat member having an upright back supporting portion and a generally horizonally aligned seat portion extending forwardly from the lower portion of said back supporting portion, said child support further having means defining first and second openings on the reawardly facing side of said back supporting portion and extending parallel to the longitudinal extent of said back supporting portion;

sidewall means extending downwardly from the lower peripheral edge of said seat portion at the front and two sides thereof to define a downwardly and rearwardly opening recess immediately below said seat portion;

a U-shaped base having a bight and two generally parallel legs, said bight and legs extending approximatley horizontally and parallel to said seat portion, said base further having a pair of upwardly extending rods contiguous with the ends of each of said legs remote from said bight and being slidingly received in said first openings in said child support, said legs of said base having wheels rotatably supported thereon for movably supporting said base on a floor surface, said bight and legs of said base being oriented beneath said seat portion and parallel thereto with said bight being located adjacent said front of said seat member and said two legs extending rearwardly therefrom;

means cooperable with said two upwardly extending rods and said child support for releasably securing said child support against movement relative to said upwardly extending rods in first and second positions thereof, said bight, legs and wheels being housed between said sidewall means in said first position and lowered downwardly out of said sidewall means in said second position, the parallel relationship between said bight, parallel legs and said seat portion being maintained throughout a movement between said first and second positions by the sliding connection between said upwardly extending rods and child support;

a handle including a manually engagable grip and two downwardly extending rods thereon being slidably received in said second openings in said child support; and

means for releasably securing said child support and downwardly extending rod against relative movement in a third position in which said handle is adjacent said child support and a fourth position in which said handle is spaced from said child support.

4,537,415

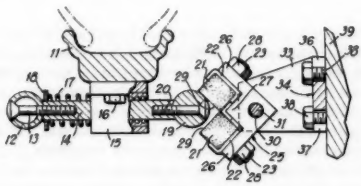
DYNAMIC BRAKE FOR MANUAL WHEELCHAIR

Ronald D. Delahoussaye, Ruston, La., and Gary W. Kelly, Atlanta, Ga., assignors to Georgia Tech Research Institute, Atlanta, Ga.

Filed Feb. 24, 1984, Ser. No. 583,407

Int. Cl.³ B62M 1/14

U.S. Cl. 280—242 WC **12 Claims**



1. In a manually propelled wheelchair having a pair of manual propulsion rings disposed adjacent to the outer sides of the two main wheels of the chair, a brake means comprising a brake ring disposed adjacent to the interior side of each main wheel, axially shiftable means connecting each propulsion ring and brake ring and responding to hand pressure applied laterally to each propulsion ring to move such ring and the associated brake ring axially inwardly relative to each main wheel, and a cooperative friction brake means attached to each side of the wheelchair structure in opposing relationship to each brake ring and becoming engaged with each brake ring to slow or stop the wheelchair when the brake ring is shifted axially inwardly by a chair occupant.

4,537,416

TRAILER HITCH ALIGNMENT DEVICE

Clyde P. Linaburg, Rte. 2, Box 493, Luray, Va. 22835

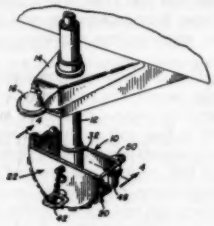
Filed Feb. 15, 1984, Ser. No. 580,197

Int. Cl.³ B60D 1/00

U.S. Cl. 280—478 R **11 Claims**

1. A trailer hitch alignment device including a generally

arcuate, upwardly opening cradle defined by a pair of spaced side supports interconnected by a generally arcuate base, a jack socket pivotally mounted between said side supports within said cradle, said socket opening upwardly of said cradle and



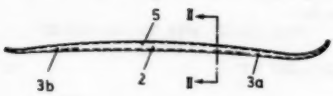
being dimensioned to receive the lower end of a conventional trailer jack shaft, and handle mounting means on said cradle for mounting one end of an elongated handle for a rocking manipulation of said cradle and a corresponding lateral movement of the pivotally mounted jack socket.

4,537,417

SKI, PARTICULARLY A CROSS COUNTRY SKI

Rudolf Hirnböck, and Adolf Haudum, both of Hohenems, Austria, assignors to Kastle Gesellschaft m.b.H., Austria

Filed Oct. 26, 1983, Ser. No. 545,480
Claims priority, application Austria, Nov. 2, 1982, 3981/82
Int. Cl.³ A63C *5/07*
U.S. Cl. 280—602 **5 Claims**



1. A cross-country ski, comprising a lower bearing sheet absorbing the occurring tensile stresses and being subdivided into at least two sheet members with each of said sheet members extending in the longitudinal direction over less than the whole length of the ski wherein the individual sheet members of said lower bearing sheet, extending in the longitudinal direction of the ski are substantially arranged one after the other and overlap one another in the direction normal to the sliding surface of the ski over less than their entire respective length, and wherein at least in the overlapping portions of said sheet members, between said overlapping sheet members at least one elastic layer of elastic-viscous material is arranged.

4,537,418

SKI BRAKE

Walter R. Knabel, Murnau, and Gerhard J. Sedlmair, Farchant, both of Fed. Rep. of Germany, assignors to Marker International, Salt Lake City, Utah

Filed Mar. 15, 1982, Ser. No. 358,372
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1981, 3110743
Int. Cl.³ A63C *7/10*
U.S. Cl. 280—605 **2 Claims**

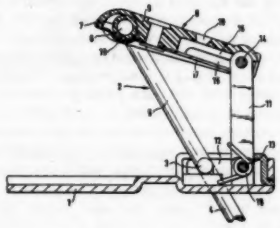
1. A brake for a ski, comprising:

lever means comprising a pivot shaft intermediate a lower lever arm and an upper lever arm, said lever means being rotatable between a braking position in which said lower arm extends below the ski and a non-braking position in which said lower arm does not extend below the ski;

an actuating arm operatively connected to said lever means and movable between a first position wherein said lever means in the braking position and a second position wherein said lever means is in the non-braking position;

a pedal having one portion rotatably attached to said upper arm and another portion rotatably attached to said actuating arm, said pedal having a skiing position for moving said lever means to the non-braking position and a non-skiing position;

biasing means for biasing said actuating arm to said first position to cause said pedal to assume the non-skiing position and move lever means into said braking position; and



attaching means for releasably attaching said pedal to said actuating arm, said attaching means comprising a pin on said actuating arm and a slot extending longitudinally in said pedal, said slot having an external opening for receiving said pin, said pedal being released from said actuating arm when said pin is moved out of said slot through said opening;

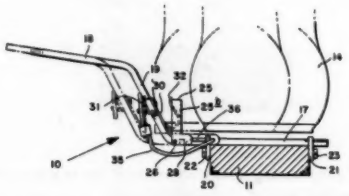
wherein said pedal includes releasing means for disconnecting said attaching means to release said pedal from said actuating arm.

4,537,419

SKIING ACCESSORY

James T. Kiernan, 204 Washington Ave., Newtown, Pa. 18940

Filed Dec. 2, 1983, Ser. No. 557,207
Int. Cl.³ A63C *11/00*
U.S. Cl. 280—607 **11 Claims**



1. For use with a ski having bindings for releasably retaining one boot, a device for supporting another boot alongside and ski while skiing comprising:

a plate having a tongue adapted to overlie said ski and an arm ofset upwardly from said tongue and extending laterally therefrom for supporting said other boot, bracket means mounted to said ski for releasably connecting said tongue thereto, and means for sensing release movement of said one boot with respect to its bindings and automatically releasing said tongue from said bracket means, including an actuator disposed adjacent to said one boot, means mounting said actuator for movement when engaged by said one boot, and latch means operable in response to movement of said actuator to permit disengagement of said tongue from said bracket means.

4,537,420

SWING-ARM-TYPE SUSPENSION WITH A LATERAL ROD FOR AN AUTOMOTIVE VEHICLE

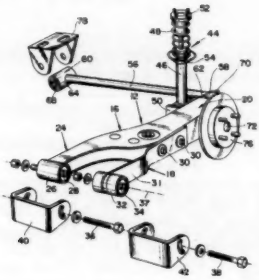
Hideo Ito, Zushi; Junsuke Kuroki, and Namio Irie, both of Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jul. 22, 1982, Ser. No. 400,941

Claims priority, application Japan, Jul. 28, 1981, 56-111002[U]; Feb. 19, 1982, 57-25500[U]

Int. Cl.³ B62D *17/00*

U.S. Cl. 280—661 12 Claims



1. A swing arm suspension for an automotive vehicle comprising:

a vehicle body;

a suspension arm having a rear portion rotatably supporting a wheel and a front portion pivotably connected to said vehicle body for vertical pivoting movement with respect to a pivot axis between said vehicle body and said suspension arm, said pivot axis crossing a longitudinal axis of the vehicle; and

a rod member having an outer end connected to said rear portion of said suspension arm and an inner end connected to said vehicle body at a point offset from said pivot axis and above the level of said outer end so that said rod moves the wheel on said suspension arm to a toe-in and negative camber position in response to cornering forces.

4,537,421

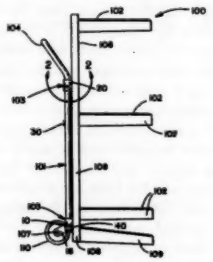
FOLDABLE DOLLY

Paul H. Teachout, 23 Acacia Dr., Orinda, Calif. 94563

Filed Jan. 3, 1984, Ser. No. 567,742

Int. Cl.³ B62B *1/04*

U.S. Cl. 280—654 5 Claims



1. A foldable dolly including frame means, arm means, and mounting means movably mounting said arm means to said frame means for rotation of said arm means with respect to said frame means between an outwardly extending deployed position and a collapsed stored position, said mounting means including interengaging shoulders providing stop means formed to limit rotation of said arm means at said deployed position, and said mounting means further including a first ramp carried by said frame means and a second ramp formed for mating sliding engagement with said first ramp and carried by said arm, said first ramp and said second ramp being formed and positioned to urge said shoulders into interengagement in said deployed position and formed to permit rotational movement of said arm means from said deployed position to said collapsed position, wherein the improvement comprises:

said stop means is provided by a first substantially vertically oriented shoulder carried by said frame means in opposed relation to said first ramp, and a second substantially vertically oriented shoulder carried by said arm means in opposed relation to said second ramp.

4,537,422

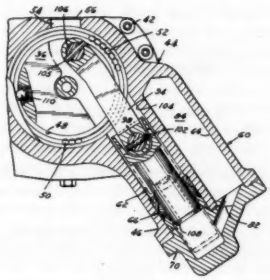
SEALING SYSTEM FOR ROAD WHEEL SUSPENSION

Glenn R. O'Rourke, Lake Orion, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Oct. 7, 1983, Ser. No. 539,782

Int. Cl.³ B60G *11/26*

U.S. Cl. 280—705 6 Claims



1. A self-contained road wheel suspension system comprising in combination, a spindle fixedly secured to a vehicle hull, a unitary road arm having a spindle housing on one end and a road wheel support on the opposite end thereof, bearing means for supporting said spindle housing for rotation relative to said spindle, means defining a single chamber gas spring means at the opposite end of said arm, and a fluid controlled damper means included within said spindle, said spring means including a gas volume and a piston rod relatively reciprocated with respect to said arm, seal assembly means carried by said arm, means defining a low pressure oil region on one end of said piston rod and means defining a high pressure oil region on the opposite end of said piston rod to submerge said seal assembly in oil and separate it from the gas volume, said rod displacing said high pressure oil region to vary the gas volume pressure.

4,537,423

BALLAST WEIGHT ARRRANGEMENT ON AGRICULTURAL PRIME MOVERS

Walter Nau, Cologne, and Jes Carstensen, Erftstadt, both of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Aug. 10, 1982, Ser. No. 406,934

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1981, 3131686

Int. Cl.³ B60R *11/00*

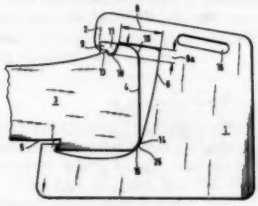
U.S. Cl. 280—759 5 Claims

1. A ballast weight arrangement on an agricultural prime mover, said arrangement comprising:

a carrier element arranged on said prime mover transverse to a longitudinal certral axis thereof, said carrier element having an end face remote from said prime mover and

extending transverse to the longitudinal central axis thereof; and

at least one plate-like ballast weight, each ballast weight having an inner side which faces said end face of said carrier element when said ballast weight in in its attached end position on said carrier element; each ballast weight being provided with a nose by means of which said ballast weight can be attached to said carrier element; and nose, in the attached position of said ballast weight, being provided in the upper region of the latter; each ballast weight also being provided with a projection which, in the attached position of said ballast weight, is located in a region thereof which extends below said carrier element; said carrier element being provided with a corresponding part with which said projection of said ballast weight cooperates in the attached end position of said ballast weight; said nose being spaced from said inner side of said ballast weight by such a distance, and a recess of such a depth being provided on said ballast weight between said nose



and said inner side thereof, that when, during an attaching position of said ballast weight, said inner side rests against said carrier element, i.e. when an upper edge of said end face of said carrier element rests against said inner side, said projection of said ballast weight can be pivoted over a lower edge of said end face of said carrier element and over that portion of the latter located ahead of said corresponding part thereof; that surface of said carrier element which faces said nose during attaching and attached positions of said ballast weight being provided with a sloped surface; said nose, when said ballast weight is being pivoted into its attached end position, cooperating with said sloped surface of said carrier element to lift said ballast weight to such an extent that said projection thereof catches in said corresponding part of said carrier element, and that said ballast weight can be arrested in tis attached end position, said sloped surface of said carrier element being provided with a depression for receiving said nose of said ballast weight to effect arresting of the latter in its attached end position.

4,537,424

CLEANING APPARATUS

Siegfried Maier, Leinfelden-Echterdingen, Fed. Rep. of Germany, and Eckart Albrecht, Romanshorn, Switzerland, assignors to Düpro AG, Romanshorn, Switzerland

Filed Sep. 30, 1982, Ser. No. 431,605

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1982, 3206464

Int. Cl.³ A47L 9/24

U.S. Cl. 285—7 **11 Claims**

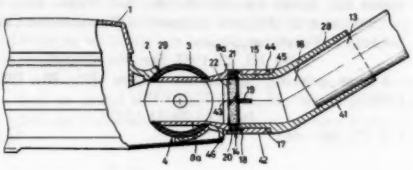
1. A cleaning apparatus for a vacuum cleaner which has a handle, said apparatus comprising:

an apparatus housing;

a joint pan connected to said housing;

a connecting piece detachably connected to said handle; and

a joint head connected to said connecting piece; said joint head and said joint pan forming a joint and delimiting a gap of movement; at least one of said joint head and said joint pan being detachably connected to its associated part, and being provided at least partially with a fiber packing which projects into said movement gap and is provided with closely packed fibers which are disposed



substantially at right angles on an associated support surface of said joint head or said joint pan.

4,537,425

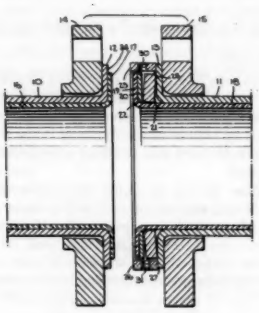
HIGH INTEGRITY FLANGE CONNECTION ARRANGEMENT

Irving D. Press, West Orange; Harvey R. Nickerson, Roseland, and Helm A. Rink, North Haledon, all of N.J., assignors to UMC Industries, Inc., Stamford, Conn.

Filed May 11, 1982, Ser. No. 377,187

Int. Cl.³ F16L 9/14

U.S. Cl. 285—55 **26 Claims**



1. An arrangement for establishing a fluid-tight seal between the faces of an assembled piping system flange connection, said arrangement comprising a rigid metal load bearing ring sized to fit between said flange faces with an inside diameter larger than the diameter of the fluid passage through said piping system at said connection and with a predetermined axial length for engaging said flange faces upon assembly of said flange connection for establishing a cavity of predetermined size bounded by said flange faces, said inside diameter and said diameter of said fluid passage; and an assemblage of components comprising at least one subset consisting of a coned ring spring, a force distributing ring, and a radial flare from a tubular element of non-metallic material, said force distributing ring being located between and adjacent said radial flare and said coned ring spring, said assemblage being disposed within said load bearing ring for location within said cavity upon its establishment, the dimension in the axial direction and the configuration of said components of said assemblage being related to the axial direction dimensions of said load bearing ring such that when said assemblage and said load bearing ring are installed in said cavity in said flange connection along with a predetermined number, including zero, of other radial flares from tubular elements of non-metallic material associated with said flange connection, and with the radial flare of said subset in contact with a respective mating surface, in said subset said coned ring spring will be partially compressed for exerting a predetermined force through said adjacent force distributing

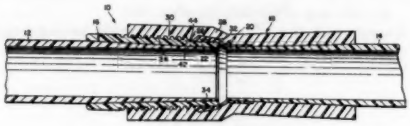
ring against said adjacent radial flare to urge said adjacent radial flare into fluid sealing engagement with said mating surface.

4,537,426

COUPLINGS FOR NON-FERROUS PIPE

J. Warne Carter, Sr., Wichita Falls, Tex., assignor to Ameron Inc., Monterey Park, Calif.

Filed Jun. 24, 1982, Ser. No. 391,826
Int. Cl.³ A16L *17/02*
U.S. Cl. 285—110 **7 Claims**



1. A coupling for joining two sections of non-ferrous pipe, at least one of said sections having an end portion which is tapered inwardly toward its extremity, said coupling comprising

a female coupling element having a first end with a tapered inner wall portion complementary to said tapered end portion of said one pipe section for receiving the same and a second end with a threaded inner wall portion,

a male coupling element adapted to be secured about an end of the remaining pipe section, said male coupling element having an externally threaded portion for threadably engaging said threaded inner wall portion of said female coupling element and having a terminal portion with a cylindrical, non-tapered outer surface receivable within said female coupling element in advance of said externally threaded portion, and

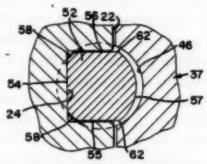
a tubular liner for effecting a fluid seal between said pipe sections when said coupling elements are threadably engaged, said liner having an internal circumferential web adjacent one end thereof for forming a lip seal against said outer surface of said male coupling element, said liner further having a tapered sleeve portion at an opposite end thereof for sealingly engaging, along its outer surface, said tapered inner wall portion of said female coupling element and for sealingly engaging, along its inner surface, said tapered end portion of said one pipe section.

4,537,427

CLIP FOR A FLUID COUPLING

Horise M. Cooke, Weatherford, Tex., assignor to Stratoflex, Inc., Fort Worth, Tex.

Continuation-in-part of Ser. No. 294,846, Aug. 21, 1981, abandoned. This application Oct. 15, 1981, Ser. No. 311,533
Int. Cl.³ F16L *37/14*
U.S. Cl. 285—305 **11 Claims**



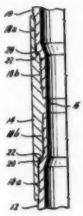
1. In a coupling including a tubular nipple part and a tubular adapter sleeve part, said parts having an axially extending flow passage formed therethrough, and said sleeve part being positioned around a portion of said nipple part when said parts are in fully assembled relation, said nipple part having an annular groove formed in the outer periphery thereof and said sleeve part having two bores formed therethrough, said bores being generally radially aligned with said groove and extending generally tangentially of said groove when said parts are assembled, said groove being generally rectangular in radial cross section and including two spaced radial side walls and an axially extending bottom wall connecting said radial side walls, and said bores being generally circular in cross section and overlying said groove when said parts are assembled, the improvement of a U-shaped clip comprising a pair of generally parallel legs and a curved center part that connects said legs, said legs thereof being positioned in said bores and groove for holding said parts in assembled relation, each of said legs having two radial sides and a bottom side interconnecting said radial sides, said sides of said legs being substantially parallel to said walls of said groove, the radial distance between said bottom sides of said legs being substantially equal to the diameter of said bottom wall whereby said bottom sides substantially engage said bottom wall, said radial sides of said legs being engageable with said radial side walls of said groove, each of said legs further having an arcuate outer side that connects said radial sides and is opposite from said bottom side, said arcuate outer side connecting with said radial sides closely adjacent said radial sides of said groove, said outer side having substantially the same radius as said bores and the radially outermost part of said arcuate outer side being spaced from the wall of said bore to form a clearance between said outermost part and said wall, portions of said radial sides of said legs being adapted to engage said radial side walls of said groove and said sleeve part being adapted to engage a surface of said arcuate outer side closely adjacent to the juncture of said arcuate outer side with a radial side and thereby reduce twisting of each arm, and said arcuate outer side extends radially outwardly from said surface of engagement of said sleeve part with said legs.

4,537,428

JOINT AND JOINT COMPONENTS FOR PIPE SECTIONS SUBJECTED TO AXIAL COMPRESSION LOADS

L. Steven Landriault, Houston, Tex., assignor to Hydril Company, Los Angeles, Calif.

Continuation of Ser. No. 192,436, Sep. 29, 1980, abandoned. This application May 19, 1982, Ser. No. 379,814
Int. Cl.³ F16L *25/00*
U.S. Cl. 285—333 **9 Claims**



1. Joint for axially compressive loaded pipe sections, comprising:

(a) a pair of pipe sections arranged end-to-end, the adjacent ends of the sections being threaded, said threads of the pipe sections being formed in two groups, the threads in one group being spaced radially and axially from the threads in other group, said threads including cylindrical, non-interference threads;

(b) a coupling member for connecting the threaded adjacent ends of the pipe sections, the coupling member including threads on each of its ends interengaged with the threads on the adjacent ends of the pipe sections, the threads on each end of the coupling member being formed in two groups, the threads in one group being spaced radially and

axially from the threads of the other group, said threads including cylindrical non-interference threads;

(c) an abutment member located between the outer ends of the pipe sections, the abutment member being shaped so that the ends of the pipe sections abut against opposite sides of the abutment member;

(d) each pipe section including a shoulder formed integral with and extending circumferentially around the section between the groups of threads, the shoulder including an angled surface which faces the angled surface on the other pipe section and is oriented at an angle substantially the same as the surface on the other pipe section, each surface terminating at a circumferential edge which is closer to the edge on the other surface than is any other portion of its respective surface;

(e) the coupling member including angled surfaces between each of said groups of threads which approach being complementary to and engaging the surfaces on the pipe sections when the joint is formed and a compressive load is applied wherein a gap is formed at either the inner or outer ends of the unequal angled surfaces on the coupling member and the pipe section when the surfaces are initially brought together and before the compressive load is applied; and

(f) whereby the angled surfaces between the thread groups of the pipe section and the coupling member enhance the load bearing surface area of the pipe sections so that when they are subjected to an axial compressive load, deformation of the sections is retarded so that the section can be loaded with greater stability near the upper rating of the section, and whereby providing the surfaces to have unequal angles which approach being complementary on full compressive loading of the joint enhances the pressure integrity of the joint because of the unequal load distribution across the surfaces.

4,537,429

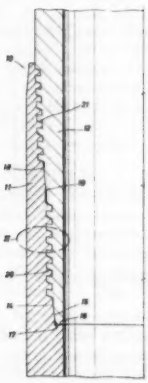
TUBULAR CONNECTION WITH CYLINDRICAL AND TAPERED STEPPED THREADS

L. Steven Landriault, Houston, Tex., assignor to Hydril Company, Los Angeles, Calif.

Filed Apr. 26, 1983, Ser. No. 488,633

Int. Cl.³ F16L *25/00*

U.S. Cl. 285—334 **12 Claims**



1. A tubular connection of pin and box members defining an axis comprising,

first and second pairs of interengaged threads on the respective members, the first pair of threads being axially spaced from the second pair of threads, the first pair of threads provided on a taper angle with respect to the axis, the second pair of threads being cylindrical threads, the first pair of threads being radially stepped with respect to the second pair of threads,

a first pair of engaged sealing surfaces on the pin and box members disposed adjacent the end of the pin member,

a second pair of engaged sealing surfaces on the pin and box members disposed axially between the first and second pairs of threads, said second pair of sealing surfaces provided at a steeper angle than the taper angle of the first pair of the threads,

engaged reverse angle torque shoulders, the torque shoulder on the pin member disposed on the end of the pin member, the torque shoulder on the box member disposed on the interior end of the box member, and

wherein said threads are hooked threads having negative angle load flanks.

4,537,430

DUCT JOINING SYSTEM

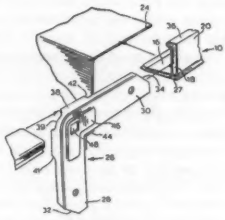
Michael T. Sullivan, Mount Hope, Canada, assignor to Exanno Products Limited, Hamilton, Canada

Division of Ser. No. 299,280, Sep. 4, 1981, Pat. No. 4,447,079, which is a division of Ser. No. 81,501, Oct. 3, 1979, Pat. No. 4,288,115. This application Feb. 14, 1984, Ser. No. 590,656

The portion of the term of this patent subsequent to Sep. 8, 1998, has been disclaimed.

Int. Cl.³ F16L *23/00*

U.S. Cl. 285—364 **10 Claims**



1. A duct jointing system, comprising:

a plurality of elongate flange members;

each flange member having a longitudinal channel portion defining a longitudinal opening for receiving therein one end of a respective wall of a section of a sheet metal duct and a longitudinal hollow portion upstanding from said channel portion, each hollow portion providing a respective outer side face for engagement by sealing means for sealing the joint between abutting flange members and having end openings at opposite ends thereof;

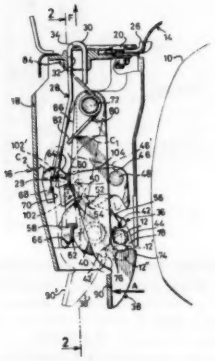
each flange member channel portion having a hollow protuberance extending longitudinally of the respective flange member and protruding beyond the said outer side face, the protuberances of immediately adjacent flange members permitting the respective immediately adjacent sheet metal duct wall ends to extend closer together to facilitate the sealing between the duct sections at the corners; and

generally L-shaped corner connecting pieces for linking said flange members together in mutually angularly disposed relationship to form a frame, each corner connecting piece comprising a pair of limbs for engagement in respective ones of said flange member end openings and a common junction portion from which said limbs extend.

4,537,431
LOCKING DEVICE, PARTICULARLY FOR A SPARE WHEEL CRADLE

Calin Philippe, Pontchartrain, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed May 6, 1983, Ser. No. 492,383
Claims priority, application France, May 6, 1982, 82-07860
Int. Cl.³ E05C 3/26
U.S. Cl. 292—216 6 Claims



1. A locking device, particularly for a cradle mounted to pivot under the floor of a vehicle, comprising:

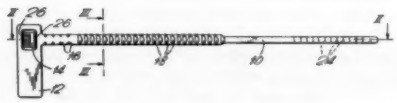
control means for releasing the cradle from inside the vehicle; and

a locking device connected to said control means and which further comprises a housing mounted under said floor of the vehicle, a retaining hook for retaining said cradle, and a safety hook positioned in said housing, said cradle being automatically locked by said safety hook upon said cradle being placed under said floor, wherein said locking mechanism further comprises means for retaining said safety hook in a retracted position and wherein release of said means for retaining said safety hook is controlled by automatic locking of said cradle by said retaining hook wherein said means for retaining said safety hook further comprises retractable stop means operatively associated with said safety hook so as to be automatically retracted when said safety hook is positioned in said retracted position, retraction of said retractable stop means being controlled automatically by the locking of said cradle by said retaining hook.

4,537,432
SECURITY SEALS

Alan M. G. Meeks, Chineham, England, assignor to ITW Limited, Windsor, England

Filed Sep. 27, 1982, Ser. No. 423,754
Claims priority, application United Kingdom, Sep. 30, 1981, 8129525; Feb. 18, 1982, 8204824
Int. Cl.³ B65D 33/34
U.S. Cl. 292—318 8 Claims



1. A one-piece plastic security seal comprising a housing having a passageway therein, a tab extending generally transversely to the housing, and a flexible strap extending generally transversely to the housing, with the strap being connected to the tab and the tab being frangibly connected to the housing by at least a first and a second lines of reduced thickness, said tab including a single aperture with said housing bridging just a central part of said aperture to leave a pair of spaced-apart end openings on opposite sides of said housing, at least said first of said lines of reduced thickness extending directly between said pair of spaced-apart end openings on the side of said housing opposite sand strap.

4,537,433
AUXILIARY HANDLE FOR A SHOVEL

Sung H. Yang, 2764 Woodland Dr., Northbrook, Ill. 60062

Filed Feb. 27, 1984, Ser. No. 584,111
Int. Cl.³ B25G 3/38
U.S. Cl. 294—58 3 Claims

1. A shovel assembly having an auxiliary handle comprising

an elongated main handle having a blade at one end and a hand grip at its opposite end;

an auxiliary handle means being affixed to said main handle;

said auxiliary handle means having a mounting member for affixing said auxiliary handle means to said main handle;

said auxiliary handle means further having a pair of integrally connected handle members, pivotally attached to said mounting member and extending in crossing relationship to said main handle;

said handle members being pivotally mounted about a pivot axis lying beneath the longitudinal axis of said main handle during use;

said pair of handle members are interconnected adjacent one end portion by an upper grip; and

said pair of handle members are further interconnected by an intermediate grip member, said intermediate grip member further acting as a stop for said pair of handle members and as a striker member for material from said blade.

4,537,434
ADJUSTABLE SELF-RELEASING HOOK

William B. Piercy, Alameda, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 2, 1984, Ser. No. 606,011
Int. Cl.³ B66C 1/38
U.S. Cl. 294—82.31 10 Claims

1. A load-carrying adjustable self-releasing hook assembly, comprising:

a. a main body structure having a fixed lower hook-shaped portion and a means for attaching the assembly to a lifting cable; said lower hook-shaped portion having a nose section and a crotch section;

b. a main hook member having a body portion and a nose portion defining together a hook crotch for the reception of load rigging and slings;

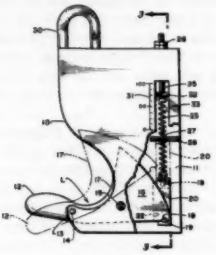
c. said main hook member being mounted to pivotally rotate between the nose portion and the hook crotch at a point toward the end of the nose section of said main body structure such that the nose portion of said main hook member and the nose section of said main body structure

are aligned in the same direction with the crotch section of the main body structure and the hook crotch of the main hook member being substantially in alignment rearward of the main hook member pivot point when the adjustable self-releasing hook assembly is in a load holding position;

d. means for securely locking said main hook member in the load holding position in alignment with the hook-shaped portion of said main body structure while a load is readied to be moved; said main hook member operable to be unlocked prior to moving a load to allow the main hook member to be pivoted when relieved of load weight;

e. an eject mechanism means mounted within said main body structure;

f. the body portion of said main hook member engaging said eject mechanism means when the body portion is pivoted



toward the load holding position that places the hook crotch in substantial alignment with the crotch section of the main body structure;

g. said eject mechanism means being operable to be adjusted to compensate for various load rigging weights to provide a force sufficient to eject the load rigging from the hook assembly when a load is lowered into place and only the weight of the load rigging remains carried by the hook assembly; said eject mechanism means operating to cause the body portion of said main hook member to pivot upward carrying the weight of residual load rigging while lowering the nose portion thereof thereby ejecting the load rigging; and

h. said main hook member being shaped to prevent entanglement of cables and lines when the main hook member releases and ejects the load rigging.

4,537,435

DOWNHOLE RETRIEVAL TOOL

Herman C. Carver, 1105A Sequoia, Bakersfield, Calif. 93308

Filed Mar. 27, 1984, Ser. No. 593,942
Int. Cl.³ E21B *31/12*
U.S. Cl. 294—86.1 **7 Claims**

1. A retrieval tool for retrieving wires lost downhole, said tool comprising:

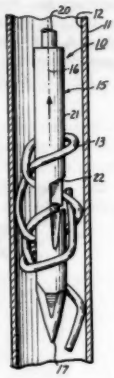
an elongated body having an axis, a smooth axially extending peripheral wall, and a notch in said wall having dimensions adequate to receive the cross-section of a wire to be retrieved, said notch being bounded by a wall at its downhole edge;

a latch member axially slidably fitted in said body, which latch member is adapted to be moved toward and away from said wall, and having a trap face which faces toward said wall;

latch bias means exerting bias force on said latch member tending to move it toward said wall;

a trip member axially slidably fitted in said body, said trip member being adapted to move into and out of said notch and having a trip face facing away from said wall; and

a catch member interposed between said body and said latch member adapted to hold said latch member away from said wall until said catch member is enabled to be moved



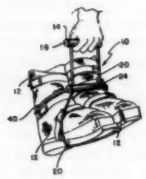
by said trip member to enable the latch member to be moved toward said wall by its said bias means.

4,537,436

BOOT CARRIER

Donald D. Pfortmiller, 806 N. Crestway, Wichita, Kans. 67208

Filed Mar. 19, 1984, Ser. No. 591,062
Int. Cl.³ B65D *63/18*
U.S. Cl. 294—150 **5 Claims**



1. A boot carrier for carrying ski boots or the like, comprising:

a handle means including a pair of opposed ends;

a rope means having two rope ends that are secured to the handle means such as to define a closed loop;

a generally hollow conduit spacer means including a pair of opposed open ends and a structure defining two pairs of spacer apertures, each spacer aperture within each pair of spacer aperture being diametrical with respect to each other, said rope means slidably passing through the two pairs of spacer apertures;

elastic cord means having a pair of cord ends and adapted for being positioned around the tops of said boots; and

means secured to said cord ends and to said spacer means such that tension on said elastic cord means causes friction where the rope means passes through the two pairs of spacer apertures in order to cause a tightening effect on the rope means.

4,537,437

NOZZLE POSITIONER FOR AUTOMATIC FUEL TANK

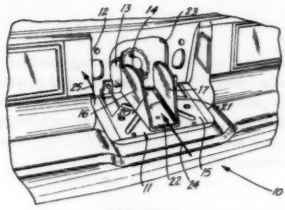
Anthony A. Buccola, 5550 Fieldston Rd., Bronx, N.Y. 10470

Filed Oct. 31, 1983, Ser. No. 547,106
Int. Cl.³ B60R *27/00*
U.S. Cl. 296—1 C **8 Claims**

1. An access port with a hose nozzle holder for a liquid filler pipe of a vehicle comprising:

a cover assembly disposed in a body of the vehicle at the site of the pipe, there being an aperture in said body providing access to said pipe, and wherein said cover assembly includes a cover pivotally mounted about an axis of pivot to said body for pivoting between an open position wherein said pipe is exposed and a closed position wherein said pipe is covered; and

a nozzle holder for aligning a nozzle with the pipe, said nozzle holder comprising a flange assembly secured to

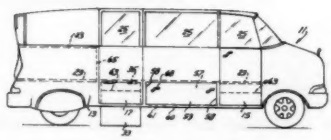


said cover and having a pair of flanges upstanding from said cover for releasable engagement with the nozzle when said cover is in the open position, said flanges being oriented generally perpendicularly to said pivot axis and being spaced apart a sufficient distance from each other to pass via said aperture alongside said pipe when said cover is in the closed position, thereby providing for a stowage of the nozzle holder when said cover is pivoted to the closed position.

4,537,438

LIMOUSINE HEARSE

Warren Reasor, 15708 Heyden, Detroit, Mich. 48223, and Mary L. Singleton, 10325 E. Outer Dr., Detroit, Mich. 48224

Filed Mar. 8, 1985, Ser. No. 709,485
Int. Cl.³ B60P *3/26*
U.S. Cl. 296—17 **5 Claims**

1. In a limousine hearse having an elongated body, front and rear ends, a roof and a pair of doors;

the improvement comprising a unit floor extending substantially the length of said body in a horizontal plane to said rear end;

a first partition upon said floor extending transversely of its length intermediate its ends and more closely adjacent said rear end;

said first partition defining an elongated passenger compartment forwardly of said partition adapted to receive a plurality of seats upon opposite sides thereof;

said first partition and floor defining a storage compartment rearwardly thereof extending to the rear of said body;

an upright second partition upon said floor within said storage compartment intermediate the sides of said body extending at right angles to said first partition defining upon one side thereof an axially elongated storage chamber adapted to receive and enclose a casket lengthwise thereof;

and upon its other side a second axially elongated storage chamber adapted to receive and enclose flowers or a second casket;

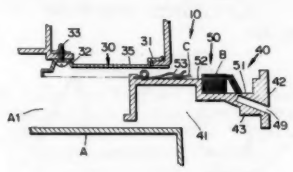
and a substantially upright closure lid hinged upon the rear end of said body normally closing off said storage chambers.

4,537,439

ASH TRAY ASSEMBLY OF VEHICLE

Syuichi Otani, Zama, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed May 10, 1984, Ser. No. 608,909
Claims priority, application Japan, Jun. 2, 1983, 58-98607
Int. Cl.³ B60N *3/08*
U.S. Cl. 296—37.9 **10 Claims**



1. An ash tray assembly of a vehicle, comprising:

an ash tray of a drawer type, formed with an ash receiving cavity on a first side thereof and having a first position in which said ash receiving cavity opens upward to function to receive ash therein;

an installation section in which said ash tray is slidably movably supported in said first position, said installation section being formed in a vehicle body;

means defining an article storing section on a reverse side of said ash tray which side is opposite the first side; and

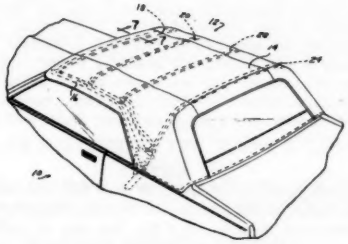
means for supporting said ash tray on said installation section in an inverted position in which said ash receiving cavity opens downward to disable said ash receiving cavity from receiving the ash while enabling said article storing section to store articles.

4,537,440

VEHICLE WITH A CONVERTIBLE TOP

Patrick H. Brockway, Taylor; Howard C. Lehr, Monroe, and Richard D. George, Trenton, all of Mich., assignors to ASC Incorporated, Southgate, Mich.

Filed Apr. 29, 1983, Ser. No. 489,819
Int. Cl.³ B60J *7/18*
U.S. Cl. 296—108 **2 Claims**



1. In a vehicle having a windshield supported between side body pillars and having a folding top comprised of a plurality of articulatable side members and interconnecting cross bows movable between raised and lowered positions, the improvement comprising:

means, carried by the folding top, for releasably latching the forward edge of the folding top to the vehicle when the top is in the raised position;

the latch means including a pivotal hook member movable

between a first latching position and a second unlatching position; and

an aperture formed in the upper portion of the side body pillar, the hook member being inserted through the aperture to engage the side body pillar when the hook member is in the first latching position to latch the folding top to the vehicle.

4,537,441

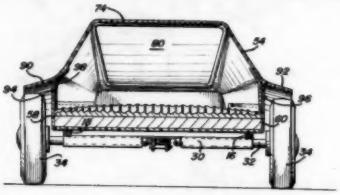
CAMPER-TRAILER

Donald J. McCleary, 733 E. McKinney, Neosho, Mo. 64850

Filed Jun. 15, 1983, Ser. No. 504,867

Int. Cl.³ B62D *63/06, 29/04*

U.S. Cl. 296—181 **12 Claims**



1. A trailer including a main frame having front and rear end portions, said front end portion including a forwardly projecting towing tongue means, said rear end portion including opposite side ground engageable support wheels, a body assembly for said main frame, said body assembly including an upwardly opening tray-type lower half defining a generally horizontal bottom wall and at least substantially peripherally continuous upwardly projecting peripheral walls each lying in a substantially vertical plane and extending about and supported from the outer periphery of said bottom wall, said body assembly also including a downwardly opening upper half defining a top wall and at least substantially peripherally continuous downwardly projecting skirt walls extending about said upper half, said upper half being downwardly telescoped over the lower half with at least the lower marginal portions of said skirt walls lapped over and sealed relative to at least the upper marginal portions of the lower half peripheral walls, opposite side portions of said skirt walls including front and rear ends, said side portions each, intermediate said front and rear ends, being vertically abbreviated and terminating downwardly in outwardly flaring and vertically arched downwardly opening integral fenders projecting laterally outwardly of the remainder of said side portions, opposite side portions of said lower half peripheral walls including portions corresponding to said vertically abbreviated skirt wall portions including upwardly arched extensions where upper edges abuttingly engage and are sealed to the underside portions of the inner portions of said fenders, said upwardly arched extensions defining inner fender well walls, said wheels including upper peripheral portions over which said fenders extend and spaced at least slightly outwardly of said inner fender well walls.

4,537,442

SLIDING AND TILTING ROOF FOR MOTOR VEHICLES

Hans Jardin, Inning, Fed. Rep. of Germany, assignor to Webasto-Werk W. Baier GmbH & Co., Fed. Rep. of Germany

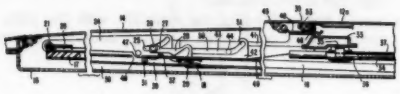
Filed Apr. 8, 1983, Ser. No. 483,176

Claims priority, application Fed. Rep. of Germany, May 14, 1982, 3218209

Int. Cl.³ B60J *7/04*

U.S. Cl. 296—221 **26 Claims**

26. In a sliding and tilting roof of the type having a rigid cover which, in a closed position, closes a roof opening, the cover being slidably displaceable from said closed position on guide elements that are pivotally connected thereto and displaceably received in lengthwise guides on opposite lengthwise sides of the roof opening, and being tiltably raisable relative to a fixed roof area about a pivot axis defined by said guide elements, and having a gutter for collecting water entering through said roof opening between the cover and fixed roof area, the improvement for conforming the outside contour of the cover, in a direction transverse to the displacement direc-



tion of said cover, to the corresponding contour of the fixed roof area, when said cover is in said closed position, comprising means for producing relative movement between the cover and the gutter in a manner causing an interengagement between the gutter and the underside of the cover that adjusts the transverse contour of said cover.

4,537,443

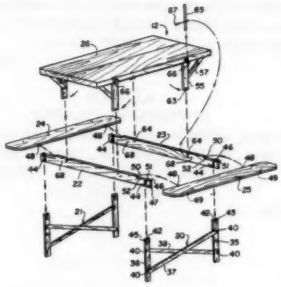
PORTABLE OCCASIONAL TABLE AND SEATING

Gilbert Bray, 6180 N.W. 7th St., Margate, Fla. 33063

Filed Oct. 7, 1983, Ser. No. 539,969

Int. Cl.³ A47B *3/06*

U.S. Cl. 297—159 **9 Claims**



1. A portable table and seating comprising

a pair of parallel spaced support beams,

a pair of bench seats each being removably attached to opposite ends of said support beams,

a pair of braced leg assemblies each being removably attached to opposite ends of said support beams,

a table top and means attached to said table top for removably connecting said table top to said support beams, and

means for cross bracing each of said pairs of leg assemblies and for folding the legs of each of said pairs of leg assemblies into a substantially collinear position.

4,537,444

OCCUPANT'S SIDE HOLDING DEVICE FOR THE SEAT BACK OF A SEAT

Katsuaki Maruyama; Yaichi Oishi, both of Toyota; Norio Noda, Okazaki; Takami Terada, and Motoi Hyodo, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Aisin Seiki Kabushiki Kaisha, both of Aichi, Japan

Filed Jun. 24, 1982, Ser. No. 391,712

Claims priority, application Japan, Jun. 25, 1981, 56-94162[U]

Int. Cl.³ A47C *7/46*

U.S. Cl. 297—284 **6 Claims**

1. An occupant's side holding device for a seat back of a seat in which occupant's body side holders are rockable in a lateral direction of the seat back at both a right side and a left side of

the seat back, said device comprising: a frame on each one of said occupant's side holders;

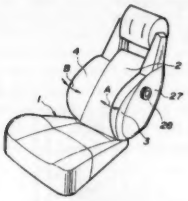
vertical operating shafts rotatable around their own axes at both a right side and a left side of a seat back frame;

a rockable arm secured to one of said operating shafts;

a nut pivotally secured to said rockable arm;

a threaded shaft rotatably journaled to the seat back frame and extending toward the lateral inside of the seat back;

the threaded part of said threaded shaft being engaged with the threaded hole of said nut;



said rockable arm and said operating shafts being integrally formed and being rocked in the lateral direction of said seat back upon rotation of said threaded shaft;

an interlocking member arranged between said operating shafts for rotating the other operating shaft symmetrically with respect to said one operating shaft;

fitting members integrally secured to said operating shafts for securing both said operating shafts to suitable positions on the frames of said occupant's side holders; and

a handle provided at an outside end of said threaded shaft.

4,537,445

CHAIR

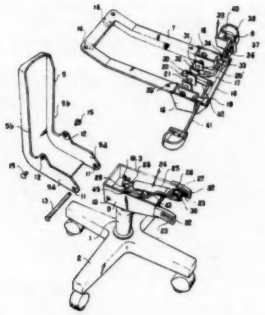
Uredat Neuhoff, Lindern, Fed. Rep. of Germany, assignor to Meiko Industrial Co., Ltd., Aichi, Japan

Filed Jul. 12, 1983, Ser. No. 513,062

Claims priority, application Japan, May 10, 1983, 58-82101

Int. Cl.[3] A47C *3/00*

U.S. Cl. 297—300 **2 Claims**



1. A chair adapted for inclination adjustment comprising:

(a) leg members and a pole brace mounted on said leg members,

(b) a box-like stationary frame member mounted on said pole brace, the front portion of said stationary frame member containing a pair of opposed generally horizontally extending slots,

(c) a base frame member for mounting a seat plate thereon;

(d) an L-shaped back rest frame member including a horizontal portion, a curved portion and a vertical portion, the free end of said horizontal portion being pivotally fixed to the rear portion of said stationary frame member, said curved portion being axially fixed to the rear portion of said base frame member,

(e) a horizontal shaft member supported on the front portion of said base frame member, the respective opposed ends of said shaft member extending through the slots contained in said stationary frame member,

(f) a gas spring pivotally fixed at one end to an inner wall of said stationary frame member and pivotally fixed at the other end of said horizontal shaft and including a push valve for actuating said gas spring, and

(g) an operation lever for actuating said push valve to operate said gas spring to thereby adjust the inclination of said back rest frame member and said base frame member.

4,537,446

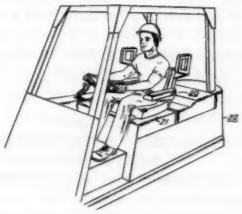
SAFETY SEAT

Thomas W. Roney, and Maynard L. Adams, both of Battle Creek, Mich., assignors to Clark Equipment Company, Buchanan, Mich.

Filed Aug. 4, 1983, Ser. No. 520,140

Int. Cl.[3] A62B *35/00*

U.S. Cl. 297—464 **18 Claims**



1. A safety seat assembly for use with industrial vehicles comprising upper and lower restraint means for keeping the body of the operator within the confines of the vehicle cab area, said assembly including a seat member and a back support member mounted generally perpendicular to the seat member, said upper restraint means including a right supporting arm extending laterally and forwardly from said back support member and having a first guard neans disposed on the outer end thereof and a left support arm extending laterally and forwardly from said back support member and having a second guard means disposed on the outer end thereof, said lower restraint means including a safety belt and one arm rest having one end of said safety belt connected thereto and another arm rest pivotable laterally outwardly from said seat member on a substantially horizontal plane and having a plurality of fastening means for receiving and releasably holding the other end of said safety belt.

4,537,447

DEVICE FOR COOLING THE BITS OF CUTTING MACHINE

Alfred Zitz; Otto Schetina, and Herwig Wrulich, all of Zeltweg, Austria, assignors to Voest-Alpine Aktiengesellschaft, Vienna, Austria

Filed May 27, 1982, Ser. No. 382,650

Claims priority, application Austria, Jun. 4, 1981, 2519/81

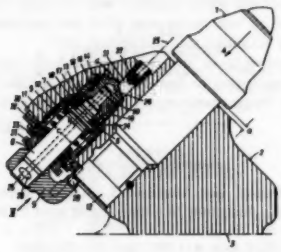
The portion of the term of this patent subsequent to Mar. 26, 2002, has been disclaimed.

Int. Cl.[3] E21C *35/22*

U.S. Cl. 299—1 **4 Claims**

1. A device for cooling the bits of a cutting machine comprising a nozzle, arranged adjacent the bit, for the cooling water to be ejected under pressure and to which nozzle the water supply can be interrupted by means of a shutoff valve assembly which includes a valve member movable within a

valve housing, the bit being supported on a bit holder for limited axial shifting movement under the action of the cutting pressure against a restoring force provided by the force of a spring and the water pressure and the shutoff valve assembly being coupled with the bit by a coupling member such that the shutoff valve opens on a shifting movement of the bit in direction of the cutting pressure, the device being characterized in that the restoring force loading the bit in opposite direction to the cutting pressure is rated such that this restoring force is at least 3000 N and is only overcome with a uniaxial cubic compression strength of the rock to be cut of at least 20 N/mm^2, the spring being supported against an adjustable abutment so that restoring force can be adjusted.



4,537,448

EXCAVATING HEAD WITH PICK-CONTROLLED WATER SUPPLY

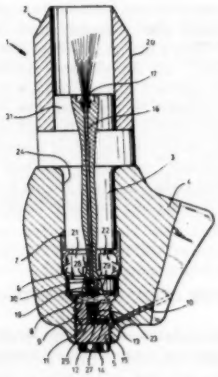
Klaus Ketterer, Krefeld, Fed. Rep. of Germany, assignor to Voest Alpine AG, Linz, Austria

Filed Nov. 10, 1983, Ser. No. 550,939

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1982, 3242137

Int. Cl.^{3} E21C *35/22*

U.S. Cl. 299—81 **10 Claims**



1. A rotary excavating head carrying tool holders in which picks with cutting tips are positioned for intermittent engagement with a formation of mineral matter to be fragmented, each of said picks having a shank received with limited linear mobility in a socket of the respective tool holder, said shank being separated from the bottom of said socket by a space of variable volume having an inlet port communicating with a source of water under supply pressure urging said shank linearly outward, said space further having an outlet port opening via a restricted passage onto a nozzle disposed in the vicinity of the respective cutting tip, said inlet port being provided with blocking means preventing a return of water from said space to said source whereby the water trapped in said space is ejected under increased pressure through said nozzle upon linear inward repression of said shank by contact of the respective cutting tip with said mineral matter.

4,537,449

VEHICLE WHEEL ATTACHING DEVICE

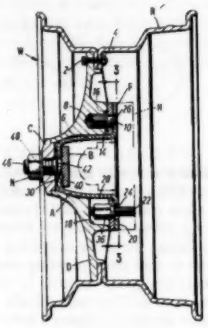
Masakazu Hayashi, Higashi-Osaka, Japan, assignor to Kabushiki Kaisha Hayashi Racing, Osaka, Japan

Filed Apr. 7, 1983, Ser. No. 482,978

Claims priority, application Japan, Dec. 24, 1982, 57-228537

Int. Cl.^{3} B60B *3/16, 3/14, 3/00*

U.S. Cl. 301—9 CN **5 Claims**



1. A vehicle wheel attaching device for removably attaching wheels to the hubs of a vehicle, comprising

an adapter attachable to a hub of the vehicle, said adapter being formed generally in the shape of a top hat having a cylindrical barrel portion with a top cap and an outwardly radially extending flaring flange at top and base ends thereof, respectively, said top cap being provided with an axially inclined inwardly projecting conical dish spring surface with a central axial bolt-receiving hole therethrough, said flange being provided with a plurality of radially symmetrical stud bolt-receiving holes and a plurality of radially symmetrical torque pin clearance holes therethrough;

an annular fitting plate substantially corresponding in diameter to said flange and having a central hole accommodating said cylindrical barrel portion of said adapter, said fitting plate being provided with a plurality of radially symmetrical conical taper nut-receiving holes and a plurality of radially symmetrical torque pin-receiving holes, said plurality of taper nut-receiving and torque pin receiving holes of said fitting plate corresponding in number and location with said plurality of stud bolt-receiving and torque pin clearance holes, respectively, of said adapter so as to be alignable therewith; and

a center bolt provided with a threaded portion, and a head having an axially inclined contact surface having an angle of inclination less than the angle of inclination of said top cap of said adapter and a diameter greater than the diameter of said central axial bolt-receiving hole of said adapter;

wherein said adapter may be mounted to a hub of the vehicle with said stud bolt-receiving holes of the adapter engaged over corresponding stud bolts of the hub and with said threaded portion of said center bolt protruding outwardly through said central axial bolt-receiving hole of the adapter such that said contact surface of said center bolt contacts an inner surface of said top cap; said fitting plate may then be mounted to the hub over said adapter with said taper nutreceiving holes engaged over corresponding stud bolts of the hub such that said fitting plate and said

adapter may be clamped to the hub with taper nuts applied to the stud bolts of the hub and engaging said taper nut-receiving holes of said fitting plate; and a wheel may be then mounted onto the hub by placing the wheel onto said barrel portion of said adapter and said fitting plate, a plurality of torque pins carried by the wheel aligning with corresponding said torque pin clearance holes of said adapter and being received by corresponding said torque pin-receiving holes of said fitting plate, a center hole of the wheel being fitted onto said threaded portion of said center bolt;

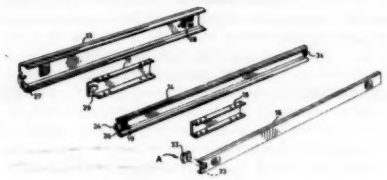
whereby the wheel may be then removably attached to the hub by applying a center nut to said center bolt such that tightening of said center nut on said center bolt causes said head portion of said center bolt to cause elastic deformation of said top cap of said adapter so as to maintain the wheel in a non-rigid fixed stabilized condition on said adapter, torque being transmitted from the hub successively through said stud bolts, said taper nuts, and said fitting plate to the torque pins carried by the wheel.

4,537,450

THREE PART SLIDE

Alan R. Baxter, Hamilton, Canada, assignor to Jacmorr Manufacturing Limited, Kitchener, Canada

Division of Ser. No. 229,980, Jan. 30, 1981, abandoned. This application May 16, 1983, Ser. No. 494,622
Claims priority, application Canada, Nov. 7, 1979, 339355
Int. Cl.³ F16C *29/04*
U.S. Cl. 308—3.8 **12 Claims**



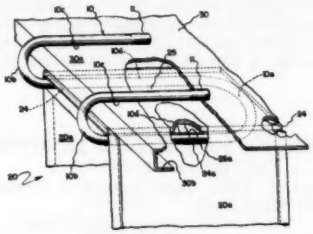
1. A three-part drawer slide comprising outer, intermediate, and inner rails, outer and inner bearings between the outer and intermediate rails and between the intermediate and inner rails, respectively, for reduced friction sliding movement of the outer rail relative to the intermediate rail and of the intermediate rail relative to the inner rail, each of said bearings comprising rolling members held in a bearing cage stop means defining a retracted condition of said rails relative to one another and an extended position of said rails relative to one another, said stop means including a stop member on one end of the intermediate rail for engaging a rear face of the outer bearing cage and a stop member on one end of the outer rail for engaging a front face of the outer bearing cage in the extended position of the intermediate rail relative to the outer rail, and said stop means further permitting the inner rail to move freely from its extended position relative to intermediate rail to is retracted position relative to the intermediate rail, first latching means for releasably latching the intermediate and inner rails together stationary relative to one another in a retracted condition of the latter relative to the former, and second latching means releasably latching the intermediate and outer rails together stationary relative to one another in said extended position of the intermediate rail relative to the outer rail having said outer bearing cage rear and front faces engaged between said stop members on the intermediate and outer rails, and said second latching means comprising a resilient latching member disengagable by applying hand pressure to the intermediate rail to retract it relative to the outer rail, and release means responsive to movement of the intermediate rail relative to the outer rail and operative to release the first latching means when the intermediate rail reaches its extended position relative to the outer rail.

4,537,451

HANGING LOCKER SHELVES

Theodore Bredderman; Virginia Bredderman; Kathryn Bredderman, and David Bredderman, all of #3 Sunset Dr., Delmar, N.Y. 12054

Filed Apr. 13, 1983, Ser. No. 469,998
Int. Cl.³ A47B *61/00*
U.S. Cl. 312—6 **1 Claim**



1. A supporting device for suspending a shelf assembly from a horizontal locker shelf, said device comprising:

a rigid support member having upper parallel horizontally spaced arms for making direct weighted contact along their entire respective bottom surfaces with the upper horizontal surface of said locker shelf,

said parallel arms respectively curving vertically downward into two lower parallel and horizontally spaced arms joined by a horizontally curved central portion, which central portion is designed to fit tautly into the uppermost pocket of a collapsible assembly of vertically spaced hanging shelves to suspend the assembly beneath the locker shelf;

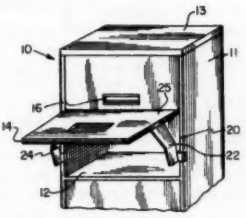
said shelf assembly having a top wall and a plurality of side walls extending downwardly therefrom, and an additional wall extending between the side walls parallel to the top wall forming a pocket with the top wall to tautly receive the support member.

4,537,452

LATERAL FILE RECEDING POSTING SHELF

Thomas E. Rice, Cheswick, and Paul R. Staropoli, Pittsburgh, both of Pa., assignors to Haskell of Pittsburgh, Inc., Verona, Pa.

Filed Sep. 28, 1982, Ser. No. 425,664
Int. Cl.³ A47B *77/10*
U.S. Cl. 312—314 **7 Claims**



7. In a lateral file having a frame and including a receding door having a front surface and an inner surface and movable between a closed position in which the door is substantially vertical, an open position in which the door is open and extend-

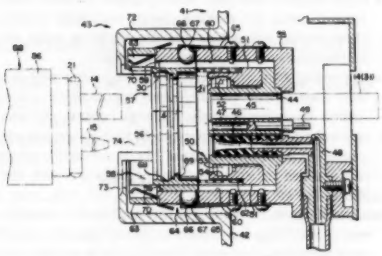
ing substantially horizontal, and a receded position in which the door has been slid inward from the open position into the file frame, the improvement comprising support means retained on the inner surface of the door and movable into engagement with the file frame to retain the door in the open position as a posting shelf, said support means including left hand and right hand supports mounted on opposite sides of said door, said supports each comprising a mounting member attached along a door edge spaced from the file frame in the open position, a spring loaded hinge attached to said mounting member, and a shelf support bracket having a first section connected to the spring loaded hinge inward of the door edge and a second section extending at an angle from said first section and a channel member connected to said second section to receive said file frame, said angle causing said channel member to be aligned with said file frame and engaged therewith when the door is retained in the open position as a posting shelf.

4,537,453

CONNECTING MECHANISM OF LIGHT SOURCE DEVICE FOR ENDOSCOPE

Haruo Takeuchi, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 17, 1984, Ser. No. 631,824
Claims priority, application Japan, Jul. 19, 1983, 58-130153
Int. Cl.³ H01R *27/00*
U.S. Cl. 339—33 **13 Claims**



1. A connecting mechanism of a light source device for an endoscope to which a various types of connectors of endoscopes are selectively connected; the first type of connector having a substantially cylindrical connector body connected at one end to the endoscope and at the other end having a recess, and at least one electric contact and a light guide tube extended along the axial direction of the connector body from the bottom of the recess; the second type of connector having a substantially cylindrical connector body connected at one end to the endoscope and closed at the other end, said connector body of the second type of connector having a diameter larger than the body of the first type of connector, a light guide tube extended along the axial direction of the body from the other end of the connector body, and at least one electric contact projected from the outer peripheral surface of the connector body; and the third type of connector having a substantially cylindrical connector body connected at one end to the endoscope and having at the other end a recess, said connector body of the third type of the connector having a diameter larger than the body of the second type of connector, and at least one electric contact and a light guide tube extended along the axial direction of the connector body from the bottom of the recess; said connecting mechanism comprising:

a socket having a connecting portion to which the light guide tubes of the various types of connectors and the electric contacts of the first and third types of connectors are connected;

first holding means for engaging with the other end of the connector body of the first type of connector to hold it when the light guide tube and the contacts of the first type of connector are connected to the socket; and

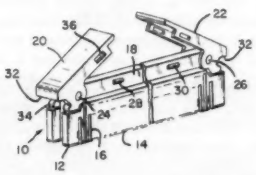
second holding means for engaging with the other end of the connector body of the second type of connector to hold it when the light guide tube of the second type of connector is connected to the socket, the second holding means having a contact portion which contacts with the other end of the connector body of the third type of connector, and being arranged to be movable between a normal position for engaging with the connector body of the second type of connector and an evacuating position for allowing the third type of connector to be connected to the socket, and the second holding means being in contact with the connector body of the third type of connector and moved to the evacuating position by the third type of connector when the third type connector is connected to the socket.

4,537,454

INTERCARD-EXTRACTION MEANS

George H. Douty, Mifflintown; John M. Landis, Camp Hill, and Clair W. Snyder, Jr., York, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 25, 1983, Ser. No. 516,626
Int. Cl.³ H01R *13/62*
U.S. Cl. 339—45 M **8 Claims**



1. In a multi plane connector system having header assemblies mounted on respective circuit boards, each header assembly having an elongated header housing of rigid insulative material containing an array of pin terminals each engaging circuitry of the respective circuit board and having an end portion exposed from a mating surface of said housing, at least one rib at each end of said header housing, connector members adapted to mate with header assemblies on adjacent pairs of circuit boards, each connector member having an elongated housing of rigid insulative material containing an array of terminals each adapted to mate with a respective pair of said pin terminals extending from said mating surfaces of headers on said adjacent circuit boards, and a releasable latching means comprising:

a pair of arm members each pivotally attached at a respective end of said connector, each arm member having first and second parallel spaced shoulders directed toward the adjacent end of said connector and each adapted to engage a respective side of said rib of said header housing,

whereby rotation of said arm member causes at least one of said shoulders to be biased against said respective side of said rib, thereby camming the connector in a desired direction.

4,537,455
ELECTRICAL CONNECTOR

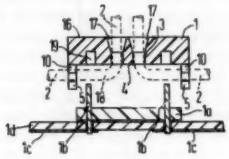
Edward Vertenten, Oostkamp, Belgium, and Josef Heft, Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 24, 1983, Ser. No. 478,531

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1982, 8208576[U]

Int. Cl.³ H01R *11/20*

U.S. Cl. 339—99 R **6 Claims**



1. A connector for connection of insulated filamentary or stranded individual electrical conductors with cut-clamp electric contact members carried on a base plate, which comprises:

a cover plate having a face adapted to lie in juxtaposition to a face of said base plate and to sandwich portions of said conductors between said plate faces;

multiple through-passage openings extending through said cover plate in a direction of the face of said base plate, sized to receive individual insulated electrical conductors and disposed in a strip-shaped central region of said cover plate, wherein said strip-shaped central region of said cover plate extends parallel to at least one longitudinal edge of said cover plate;

opposite longitudinal edges of said cover plate each having a wall extending from the face of said cover plate in the direction of said base plate, each wall including retaining members disposed intermediate a plurality of detent slots,

said detent slots being open to an edge of the respective wall and being adapted to retain individual conductors in substantially parallel relation to said face of said cover plate so that when a conductor is inserted through said openings and retained by said retaining member, it is contactable by a cut-clamp contact carried by said base plate in a region of said conductor sandwiched between said plate;

said through-passage openings being arranged in two rows which are parallel to longitudinal edges of said cover plate and the retaining members on one wall being associated with the one row and the retaining members on the opposite wall being associated with the other row;

mating detent means on said cover and base plates for releasably locking the plates together; and

at least one electric conductor having its two ends inserted through two of said through-passage openings in said cover plate and having two end portions thereof sandwiched between said cover and base plates with its two ends contained within separate detent slots.

4,537,456
ELECTRICAL CONNECTOR

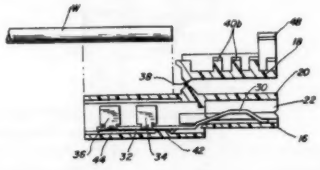
Vincent B. Brown, Prospect Heights; Charles A. Kozel, McHenry; John T. Scheitz, Palatine, and John E. Armando, Schiller Park, all of Ill., assignors to Methode Electronics Inc., Chicago, Ill.

Filed Jun. 7, 1982, Ser. No. 386,016

Int. Cl.³ H01R *13/38*

U.S. Cl. 339—99 R **10 Claims**

1. An electrical connector of the type having an unsulator housing and a plurality of conductive contacts within the housing for terminating corresponding insulated conductors, each contact having at least one pair of insulation displacement jaws which receive an insulated conductor therebetween and sever the insulation to make electrical contact with the conductor, the improvement comprising, in combination, an insulator housing including a top and a base, said base having a plurality of parallel compartments for mounting individual metal contacts, a metal contact positioned in each of said parallel compartments with a forward mating contact portion extending toward a forward end of said base and a rearward contact portion disposed in a rear portion of said base, said rearward contact portion having at least one pair of insulation displacement jaws for terminating an insulated conductor, said top including a rigid forward top wall and a hinged rear top wall which is hingedly connected at the rear of said rigid forward top wall, bottom wall means for cooperating with said forward top wall and hinged rear top wall in the closed position for enclosing said metal contacts, a plurality of bosses formed on the bottom of said hinged rear top wall with at least one boss aligned with each of said parallel compartments and projecting sufficiently so when said cover is in a closed position it functions as a termination tool, said hinged rear top wall being movable between an open position where it folds back over the top of said rigid forward top wall to expose said insulation displacement jaws and permits a conductor to be positioned in each of said compartments adjacent a corresponding pair of said jaws, and a closed position where said bosses terminate said conductors and said hinged rear top wall insulates said rearward contact portions, where at least one boss aligned with each of said compartments is dimensioned and located so when said cover is closed the boss forces a conductor positioned in that compartment into electrically contacting relation with said contact in said compartment and also said boss projects into interfering relation with the contact located in said compartment thereby serving to longitudinally retain said contact in said compartment when a pulling force is applied to an insulated conductor terminated therein, said electrical connector being capable of connection with an inverted connector of identical design.



4,537,457
CONNECTOR FOR PROVIDING ELECTRICAL CONTINUITY ACROSS A THREADED CONNECTION

Albert P. Davis, Jr., and Leon H. Robinson, both of Houston, Tex., assignors to Exxon Production Research Co., Houston, Tex.

Continuation of Ser. No. 489,639, Apr. 28, 1983, abandoned. This application Feb. 4, 1985, Ser. No. 697,689

Int. Cl.³ H01R *3/00*

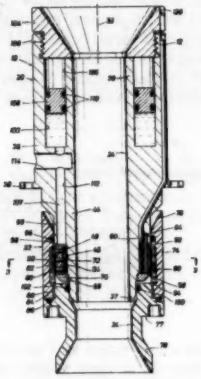
U.S. Cl. 339—117 P **14 Claims**

1. A connector for establishing electrical continuity between a plurality of conductors in a first element and a plurality of corresponding conductors in a second element, said first element having a box end and said second element having a pin end adapted to be threaded into said first element box end, said first and second elements defining, in the assembled condition, a longitudinal axis and a longitudinally extending, central recess adapted for receiving fluid flow therethrough, said connector comprising:

a generally annular connector box element fixedly positionable within said second element pin end, said connector box element having a plurality of circuit bands, said circit bands lying in planes perpendicular to said longitudinal axis and having a center of curvature on said longitudinal

axis, said circuit bands being adapted to be connected to corresponding ones of said second element conductors;

a generally annular connector pin element fixedly positionable within said first element box end, said connector pin element having a plurality of circuit band contacts, said circuit band contacts being adapted to be connected to corresponding ones of said first element conductors, said conductor pin element being adapted to be so positioned within said first element box end and said circuit band contacts being so arranged that in response to said first and second elements being threadably connected, said



circuit band contacts are biased against corresponding ones of said circuit bands;

means for establishing an enclosed, sealed volume surrounding said circuit bands and circuit band contacts, said enclosed, sealed volume being adapted to be occupied by a dielectric fluid; and

means for varying the pressure of said dielectric fluid within said enclosed, sealed volume in response to pressure changes within said central recess such that the pressure differential across all sealed interfaces separating said enclosed, sealed volume from said central conduit is maintained within a preselected range.

4,537,458

CONDUCTIVE SHIELDING HOUSING FOR FLAT CABLE CONNECTOR

Sidney V. Worth, Flourtown, Pa., assignor to Continental-Wirt Electronics Corp., Southampton, Pa.

Filed Sep. 1, 1983, Ser. No. 528,624
Int. Cl.[3] H01R *13/698*
U.S. Cl. 339—143 R **22 Claims**

1. A conductive shielding enclosure for a generally flattened rectangular multiconductor cable connector having an outer conductive sheath; said connector having a generally rectangular configuration which has generally flat parallel faces which are joined at their edges by first and second generally parallel sides which has first and second ends; said connector having a flat shielded multiconductor cable extending from said first end thereof; said connector having a plurality of contacts; each of said plurality of contacts connected to a respective one of the conductors of said multiconductor cable; said shielding enclosure comprising first and second conductive end cups which are adjacent to and which extend across said first and second sides respectively of said connector and first and second conductive side plates which are adjacent to and extend across said first and second faces respectively of said conductors respectively; said first and second end cups and said first and second side plates extending beyond said one end of said connector; means connecting said first and second side plates and said first and second end cups together to form a rectangular enclosure which defines a hollow interior region surrounding said cable connector and extending from said one end of said connector; the multiconductor cable connector being loosely bent within said hollow interior region and pressed by the force of its inherent resiliency to flexibly con-

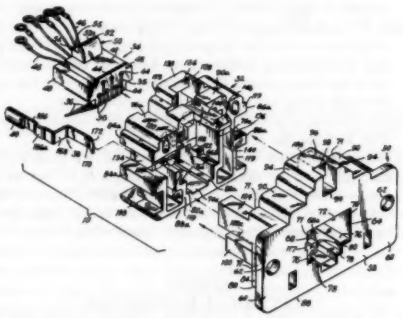
nect the outer surface of the conductive sheet into electrical engagement with at least a portion of the interior of said generally rectangular configuration enclosure formed by said first and second end cups and said first and second side plates.

4,537,459

JACK FOR EMI/RFI SHIELD TERMINATING MODULAR PLUG CONNECTOR

Robert J. Brennan, Ossining; Terrence Meighen, Stormville, and Walter M. Phillipson, Woodside, all of N.Y., assignors to Stewart Stamping Corporation, Yonkers, N.Y.

Filed Jan. 16, 1984, Ser. No. 570,806
Int. Cl.[3] H01R *13/652*
U.S. Cl. 339—143 R **21 Claims**



1. A jack for a modular plug connector which terminates a cord constituted by a plurality of insulated conductors surrounded by a sheath of conductive material constituting a shield for suppressing radiation of electromagnetic and radio frequency interference-causing signals from and to the conductors, the modular plug connector including a dielectric housing having a cord-receiving aperture communicating with an internal cord-receiving cavity having a conductor-receiving portion in which the cord conductors are situated, a plurality of flat contact terminals having conductive piercing portions and contact edges, each flat contract terminal being situated in a

respective slot in the housing aligned with a respective conductor with its piercing portion piercing said respective conductors to electrically engage the same and wherein the contact edges of the flat contact terminals are exposed at a common side wall of the housing, and shield terminating contact means passing through a side wall of said connector housing electrically engaging said shield, the shield terminating contact means including an externally exposed portion situated at the exterior surface of one of the walls of the connector housing, the jack comprising:

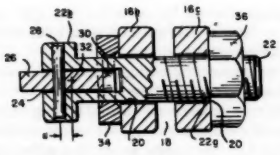
a jack housing having a receptacle for the modular plug connector, an array of contact wires mounted in said jack housing having portions situated within said connector receptacle adapted to be electrically engaged by contact edges of respective flat contact terminals upon insertion of the modular plug connector into said connector receptacle, grounded jack contact means adapted to be electrically engaged by said externally exposed portion of said shield terminating contact means upon insertion of the modular plug connector into said connector receptacle and wherein at least a portion of said jack housing is formed of a material which attenuates electromagnetic and radio frequency interference-causing signals passing therethrough so that the jack housing constitutes an EMI/RFI shield for the modular plug connector.

4,537,460

QUICK RELEASE CLAMP FOR BATTERY CABLE CONNECTOR

John R. McCaig, Wilmington, Mass., assignor to McNold Corp., Wilmington, Mass.

Filed Apr. 27, 1984, Ser. No. 604,851
Int. Cl.³ H01R *11/26*
U.S. Cl. 339—235 **7 Claims**



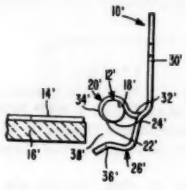
1. A quick release clamp for applying the laterally constrictable ears of a cable connector to the terminal of an electric storage battery, comprising: a bolt having a threaded shank terminating at one end in an enlarged head and having a slit extending axially through said head into said shank, said shank being dimensioned to extend through aligned holes in said ears with said enlarged head being located on the outermost side of one of said ears; a nut threaded onto said shank on the outermost side of the other of said ears; and a cam lever received in said slit, said lever being rotatably connected to said bolt by means of a pin extending transversally across said slit, said lever being adjustable between a closed position cooperating with said bolt and nut to laterally urge said ears together to grip said terminal therebetween, and an open position permitting said ears to move away from each other to an extent sufficient to permit said cable connector to be removed from said terminal.

4,537,461

LEAD HAVING A SOLDER-PREFORM AND PREFORM-CARRYING FINGER ENGAGEABLE DIRECTLY WITH A CONTACT PAD

Paul J. Ouellette, Amesbury, Mass., assignor to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Jul. 28, 1982, Ser. No. 402,684
The portion of the term of this patent subsequent to Feb. 19, 2002, has been disclaimed.
Int. Cl.³ H01R *11/22, 4/02*
U.S. Cl. 339—258 R **8 Claims**



7. A solder-bearing lead, which comprises:

an elongated stem;

first and second resilient clamping fingers having opposed clamping portions extending in opposed spaced relationship from the elongated stem to define a gap for the reception of a substrate therebetween, the clamping portion of the first resilient clamping finger having an inner surface;

a solder preform attached to the inner surface of the clamping portion of the first resilient clamping finger and having a surface portion in opposed relationship to the clamping portion of the second resilient clamping finger;

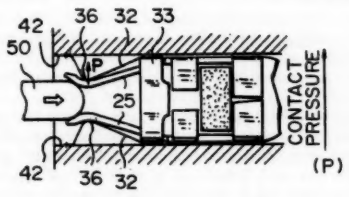
the clamping portion of the first resilient clamping finger being partially wrapped about the solder preform in a direction facing toward the clamping portion of the second resilient clamping finger and having an outer end portion which is of a tapered configuration such that an outer end surface portion of the clamping finger outer end portion is essentially flush with the surface portion of the solder preform, and such that both the clamping finger outer end surface portion and the preform surface portion directly engage a contact pad on the substrate when the substrate is received between the finger clamping portions.

4,537,462

ELECTRICAL CONNECTOR

Sakae Manabe, Kawasaki, Japan, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 30, 1984, Ser. No. 636,033
Claims priority, application Japan, Sep. 9, 1983, 58-139213
Int. Cl.³ H01R *13/16*
U.S. Cl. 339—259 R **9 Claims**



1. A spring assist means for a female electrical contact terminal, said female terminal having opposing contact arms to receive therebetween contact portions of a male terminal and being secured within a cavity of an insulating housing, said

spring assist means comprising a spring body portion and leaf spring portions, said spring body portion securable to a body portion of said female terminal remote from contact portions of said contact arms, said leaf spring portions extending from said spring body portion along and proximate outer surfaces of said contact arms and including free ends engageable with and slidable along associated side walls of said housing cavity, whereby when a said male terminal is inserted into and between said contact arms, said contact arms are urged into engagement with said leaf springs whose free ends are urged into slidable engagement with said cavity side walls and thereby provide spring force against said contact arms increasing contact force of said contact arms with contact portions of said male terminal.

4,537,463

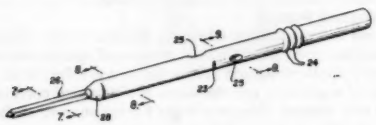
SPRING CONTACT HOLDING SHELL HAVING INTEGRAL WIRE WRAP POST

Russell E. Coiner, Staunton, and Thomas W. Moore, Fisherville, both of Va., assignors to Virginia Panel Corporation, Waynesboro, Va.

Filed Jun. 27, 1984, Ser. No. 625,206

Int. Cl.³ H01R *4/14*

U.S. Cl. 339—276 A **1 Claim**



1. A unitary holding shell and wire wrap post comprising an elongated cylindrical tubular holding shell body portion having an open rear end, said holding shell body portion being provided somewhat forwardly of its open rear end with press rings projecting somewhat beyond the periphery of the holding shell body portion, an integral forward end coaxial reduced cross sectional size wire wrap post on the holding shell body portion and being elongated, a comparatively short conically tapered transition portion joining the rear of the wire wrap post to the forward end of the holding shell body portion, and the wire wrap post being hollow and approximately square in cross section and having four concave side walls forming four pronounced closed corners on the wire wrap post extending substantially for its entire length.

4,537,464

INFRARED OBJECTIVE SYSTEM LENS

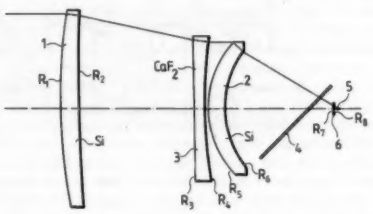
Roman Boutellier, Stüsslingen, Switzerland, assignor to Kern & Co. Ltd., Aarau, Switzerland

Filed Jun. 22, 1983, Ser. No. 506,595

Claims priority, application Switzerland, Jun. 25, 1982, 3912/82

Int. Cl.³ G02B *9/14, 13/14*

U.S. Cl. 350—1.4 **2 Claims**



1. An infrared objective system lens with an image field that is convex toward the lens with a radius of curvature of 17.5, wherein the elements of the system have the following numerical values:

Lens Element Number	f = 100.0 Radius of Curvature	Axial Thicknesses and Separations	Material
1	$R_1 = 335.5$	t = 10.0	Si
	$R_2 = 819.8$	s = 59.6	air
3	$R_3 = 914.5$	t = 5.4	CaF_2
	$R_4 = 260.0$	s = 1.6	air
2	$R_5 = 49.2$	t = 9.1	Si
	$R_6 = 51.8$		

where the indicated values of R_1, R_2, R_5 and R_6 may vary by ±5%, the indicated values of R_3 and R_4 may vary by ±20%, f is the focal length of the system and R is the radius of curvature of the indicated elements.

4,537,465

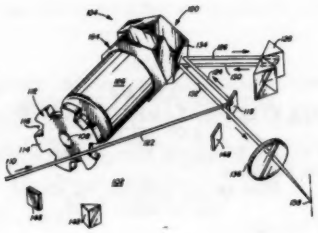
APPARATUS WITH TWO INPUT BEAMS FOR GENERATING OPTICAL SCANS

Randy J. Sherman, and Derald F. Hanson, both of Phoenix, Ariz., assignors to Lincoln Laser Company, Phoenix, Ariz.

Continuation-in-part of Ser. No. 320,331, Nov. 12, 1981, Pat. No. 4,433,894. This application Jun. 6, 1983, Ser. No. 501,504

Int. Cl.³ G02B *27/17, 27/14*

U.S. Cl. 350—68 **19 Claims**



1. An optical scanner for receiving an input beam and for generating an optical output beam which repetitively scans a fixed path comprising:

a. means for converting a single input beam into alternating upper and lower input beams;

b. a first mirror repetitively rotated through an angle about a vertically oriented first axis for receiving the upper input beam and for repetitively generating a first scan;

c. a second mirror repetitively rotated through an angle about the first axis for receiving the lower input beam and for repetitively generating a second scan, said first and second mirrors having a relative phase angle greater than zero and random facet to axis errors;

d. first means for redirecting the first scan back onto the first mirror to form a first redirected scan, wherein the first redirected scan is reflected from the first mirror to generate a plurality of first output scans which define a family of non-coincident surfaces, said family of surfaces being non-intersecting with respect to the upper input beam, the first redirected scan being vertically displaced from the first scan by a distance related to the mirror facet to axis error and laterally displaced from the first scan by a distance related to the relative angle between the mirror and the upper input beam;

e. second means for redirecting the second scan back onto the second mirror to form a second redirected scan, wherein the second redirected scan is reflected from the

second mirror to generate a plurality of second output scans which define a family of non-coincident surfaces, said family of surfaces being non-intersecting with respect to the lower input beam; the second redirected scan being vertically displaced from the second scan by a distance related to the mirror facet to axis error and laterally displaced from the second scan by a distance related to the relative angle between the mirror and the lower input beam; and

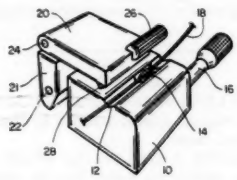
f. means for converging the plurality of first and second output scans onto the fixed path such that the optical output beam from said scanner repetitively scans the fixed path thereby eliminating the effect of the facet to axis errors of the first and second mirrors and doubling the effective scan efficiency of the optical scanner.

4,537,466

OPTICAL FIBER CHUCK INCLUDING A COVER COMPRISING AN IDLER WHEEL AND A V-SHAPED INSERT

Marc F. Moisson, Los Altos, and Martin L. Wisecarver, Sonora, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Feb. 15, 1983, Ser. No. 466,683
Int. Cl.³ G02B 5/14; B25B 11/02
U.S. Cl. 350—96.20 **7 Claims**



1. An optical fiber chuck, comprising:

(a) a chuck body having on its upper surface a straight V-groove into which an optical fiber can be loaded;

(b) a drive wheel rotatably mounted on the chuck body such that a portion of its circumference intersects the V-groove in the chuck body to such an extent that it will engage a fiber loaded into the V-groove;

(c) drive means for rotating the drive wheel;

(d) a chuck cover pivotably mounted on the chuck body between a loading position and an operating position;

(e) an idler wheel rotatably mounted on the chuck cover such that when the chuck cover is in its operating position and a fiber is loaded into the V-groove of the chuck body, the idler wheel presses the fiber against the drive wheel to ensure adequate friction between the fiber and the drive wheel;

(f) a chuck cover insert mounted in the chuck cover and having a V-shaped lower surface such that when the chuck cover is in its operating position the V-shaped lower surface of the insert enters the V-groove of the chuck body, the apex of the V-shaped lower surface being so shaped that it cooperates with the V-groove of the chuck body to hold a fiber which has been loaded into the V-groove; and

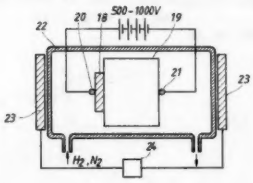
(g) means for urging the chuck cover against the chuck body when the chuck cover is in its operating position.

4,537,467

HERMETIC SEALING OF GALLIUM ARSENIDE COMPONENTS

Chantal Dubon, Versailles, France; Bertil Hök, and Christer Ovrén, both of Västerås, Sweden, assignors to ASEA Aktiebolag, Västerås, Sweden

Filed Jun. 17, 1983, Ser. No. 505,278
Claims priority, application Sweden, Jun. 21, 1982, 8203826
Int. Cl.³ G02B 5/14; C23C 13/04
U.S. Cl. 350—96.20 **22 Claims**



1. A gallium arsenide opto-component comprising an interface between a body of gallium arsenide and a body of glass, said interface being free of surface irregularities larger than 0.1 μm and smaller than 100 μm and said gallium arsenide body and said glass body being hermetically sealed together at said interface,

said interface being free from any bonding medium and having no optically detectable tints, and

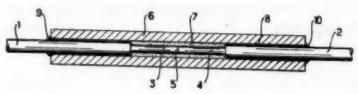
said glass body having a concentration of oxygen which, at least in a 10 μm layer adjacent to the interface, is considerably lower than the stoichiometric concentration needed for the formation of oxides selected from the group consisting of gallium oxides and arsenic oxides.

4,537,468

REINFORCED OPTICAL FIBER BUTT WELD CONNECTION

Bernard Degoix; Daniel Boussemaer, both of Calais, and Didier Allemand, Marck, all of France, assignors to Les Cables de Lyon, France

Filed Oct. 20, 1982, Ser. No. 435,592
Claims priority, application France, Oct. 28, 1981, 81 20212
Int. Cl.³ G02B 5/14
U.S. Cl. 350—96.21 **5 Claims**



1. A reinforced butt weld connection between the ends of two optical fibres, said fibres having a protective sheath over most of their length and having an end portion stripped of said sheath, said connection comprising a capillary tube made of a metal of high mechanical strength, said tube surrounding a butt weld between said fibre ends and adjacent stripped portions of optical fibre and extending over a non-stripped portion of each of said fibres, said tube having a bore which leaves little clearance around the sheaths of the optical fibres and a slow-setting adhesive which is very fluid in the liquid state and which hardens in the absence of air filling the space between the capillary tube and the stripped ends of the fibres and between the capillary tube and the sheaths of the fibres by capillarity to the extent of the entire volume of said space between the fibres and the internal surface of the capillary tube with the slow-setting adhesive completely wetting the surfaces of the optical fibres and the tube with which it contacts to facilitate complete

transmission of the traction forces applied to the fibres to the capillary tube.

4,537,469

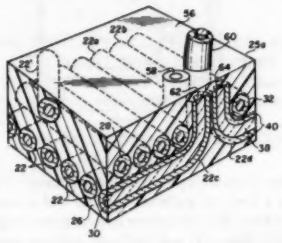
MULTI-FUNCTION COMPOSITE MATERIAL UTILIZING EMBEDDED OPTICAL FIBERS

Hartmann J. Kircher, Sparta, N.J., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Continuation of Ser. No. 614,385, May 25, 1984, abandoned, which is a continuation of Ser. No. 337,977, Jan. 1, 1982, abandoned. This application Dec. 21, 1984, Ser. No. 684,176

Int. Cl.³ G02B *5/16*

U.S. Cl. 350—96.24 **6 Claims**



1. A reinforced structural member for detecting fires occurring in the vicinity of the member and comprising:

a binder material conforming to a desired shape of the structural member;

a plurality of high tensile strength optical fibers imbedded in the binder material and rigidly adhering thereto to reinforce the structural member;

the fibers including first ends optically exposing the fibers to a flame occurring in the vicinity of the ends; and

optical signal receiving means located at opposite ends of the fibers for detecting the occurrence of light travelling along the length of the fibers, produced by a flame.

4,537,470

SCREEN SYSTEMS FOR MULTICOLOR PRINTING

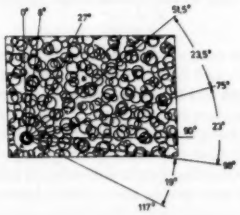
Johannes Schoppmeyer, St. Augustin, Fed. Rep. of Germany, assignor to Dr.-Ing. Rudolf Hell GmbH, St. Augustin, Fed. Rep. of Germany

Filed Nov. 4, 1982, Ser. No. 438,989

Claims priority, application European Pat. Off., Nov. 20, 1981, 81109796.3

Int. Cl.³ G02B *5/22*

U.S. Cl. 350—317 **9 Claims**



1. A screen system for color reproduction comprising first, second, and third screens of different colour separations each having different screen angles and line spacings, said screens having lines which lie at successive angles selected from the ranges of 19° to 24°, 25° to 29°, and 32° to 36°, as measured in a common direction from the first screen to the second screen, and from the second screen to the third screen, the tolerance range for screen fineness extending to plus or minus approximately 12% of the mean screen fineness.

4,537,471

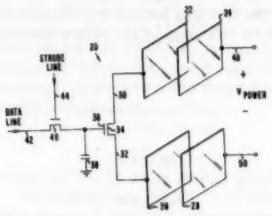
LIQUID CRYSTAL PIXEL DRIVER CIRCUIT AND MATRIX DISPLAY

Jan Grinberg, Los Angeles, and Michael J. Little, Tarzana, both of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed Dec. 23, 1983, Ser. No. 564,954

Int. Cl.³ G02F *1/13*

U.S. Cl. 350—333 **9 Claims**



1. A liquid crystal light valve pixel driver circuit comprising:

(a) a pair of power electrodes having a voltage potential applied thereinbetween;

(b) a pair of half-pixel electrodes, each of said half-pixel electrodes being associated with a respective one of said power electrodes; and

(c) a first transistor switch selectably conductively interconnecting said half-pixel electrodes, said first transistor switch being responsive to an applied voltage data potential.

4,537,472

OBJECTIVE LENS SYSTEM FOR MICROSCOPES

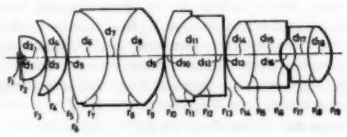
Yoshito Asoma, Nagano, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 6, 1984, Ser. No. 577,336

Claims priority, application Japan, Feb. 15, 1983, 58-22162

Int. Cl.³ G02B *9/62, 21/02*

U.S. Cl. 350—414 **3 Claims**



1. An objective lens system for microscopes comprising a first cemented doublet component comprising a plano-convex lens element and a meniscus lens element having a strongly concave surface on the object side, a second meniscus lens component, a third cemented component comprising a positive lens element, a negative lens element and a positive lens element, a fourth cemented component comprising a negative meniscus lens elements, a biconvex lens element and a negative lens element, and a fifth cemented doublet component and a sixth cemented doublet component respectively having strongly concave surfaces opposite to each other, said lens system being so designed as to satisfy the following conditions (1) through (6):

$$-0.1 < f/f_2 < 0.05 \quad (1)$$

$$-0.1 < f/f_B < -0.07 \quad (2)$$

$$1.75 < n_2 \quad (3)$$

$$29 < \nu_5 < 45 \quad (4)$$

$$60 < \nu_6, \nu_8 \quad (5)$$

$$d_{16} < 1.2f \quad (6)$$

wherein the reference symbol f represents focal length of said objective lens system as a whole, the reference symbol f_2 designates focal length of the image side lens element of said first lens component, the reference symbol f_B denotes composite focal length of said fifth and sixth lens components as a whole, the reference symbol n_2 represents refractive index of the image side lens element of said first lens component, the reference symbols ν_5 and ν_6 designate Abbe's numbers of the middle negative lens element and the image side lens element respectively of said third lens component, the rererence symbol ν_8 denotes Abbe's number of the middle positive lens element of said fourth lens component and the reference symbol d_{16} represents airspace reserved between said fifth and sixth lens components.

4,537,473

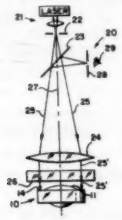
FIDUCIAL SURFACES

Richard O. Maschmeyer, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Continuation of Ser. No. 439,341, Nov. 5, 1982, abandoned. This application Aug. 13, 1984, Ser. No. 639,738

Int. Cl.³ G02B *3/02*

U.S. Cl. 350—432 **3 Claims**



1. A method for optically measuring any tilt in the alignment of the axis of symmetry of the surface of a molded aspheric lens relative to the optical axis of an optical system which comprises the steps of:

(a) molding said lens to its final size and shape with a fiducial surface thereon, said fiducial surface having a predetermined location and alignment relative to the axis or point of symmetry of the optical surface of said lens;

(b) directing light waves onto said optical surface of said lens that are oriented to the optical axis of said optical system; and

(c) observing

(1) the interference pattern generated by said light waves reflecting off said fiducial surface and off a reference surface which is interposed between said fiducial surface and the source of said light waves and is aligned in a direction normal to the optical axis of said optical system; or

(2) the specific angle at which said waves are reflected off said fiducial surface; or

(3) the specific angle at which said light waves are bent while being transmitted through said fiducial surface.

4,537,474

OPTICAL SYSTEM FOR PROJECTION

Ulf J. Asterö, Tumba, Sweden, assignor to Optik Innovation AB OIAB, Tumba, Sweden

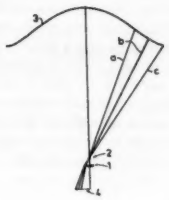
PCT No. PCT/SE81/00223, § 371 Date Feb. 25, 1982, § 102(e) Date Feb. 25, 1982, PCT Pub. No. WO82/00529, PCT Pub. Date Feb. 18, 1982

PCT Filed Jul. 29, 1981, Ser. No. 355,757

Claims priority, application Sweden, Jul. 30, 1980, 8005475

Int. Cl.³ G02B *3/04, 9/02;* **G03B** *21/56*

U.S. Cl. 350—432 **9 Claims**



1. An optical system for a projector apparatus which is preferably adapted for projecting an image on a display screen with a generally negative curvature, characterized in that the system includes a single-element lens with a generally convex front surface oriented towards the object plane and with a generally non-parallel concave rear surface, both surfaces of the lens being aspherically corrected so that in annular areas concentric with the lens axis the lens surfaces have positive deviation in the vicinity of said axis, then negative deviation, and outmost positive deviation, said deviation being related to the best suited sphere for the respective lens surface, wherein the best suited sphere for the front and back surfaces of the lens has radii of the order of magnitude +110 mm and +1650 mm, respectively, and in that the lens is provided with a diaphragm having an aperture of about 45 mm and being arranged about 70 mm in front of the back lens surface, and the lens has an aperture attaining about 100 mm, said system being suited to projecting an object with a format of the order of magnitude of 190×250 mm with an enlargement of about 6 to 8 times.

4,537,475

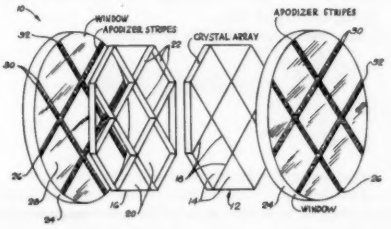
SCATTERING APODIZER FOR LASER BEAMS

Mark A. Summers; Wilhelm F. Hagen, and Robert D. Boyd, all of Livermore, Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 1, 1983, Ser. No. 481,411

Int. Cl.³ G02B *3/00, 27/46*

U.S. Cl. 350—448 **7 Claims**



1. A harmonic conversion device for converting a single input laser beam at a fundamental frequency to a single output laser beam at a harmonic frequency, said device being for use

in a large aperture laser system, said device being comprised of a plurality of crystals which are fitted together to form a single conversion device of diameter sufficient for use in a large aperture laser system, a grid of divider elements provided between said crystals, said grid elements constituting optical discontinuities that produce diffraction peaks as a single laser beam is passed through all of the crystals of the conversion device, said device further comprising:

transparent means for retaining said grid and crystals,

a scattering apodizing pattern carried by said means,

said pattern having a central portion overlying said grid of divider elements and a narrow boundary portion extending slightly beyond said grid elements, leaving the major portion of said crystals unobstructed for passage of a laser beam therethrough and conversion therein,

said scattering pattern having a distribution density which is at a maximum in said central portion and which tapers gradually and smoothly to zero in said boundary portion to provide a gradient of said distribution density,

said scattering pattern smoothing, reducing and minimizing the diffraction peaks produced by the optical discontinuities introduced by said grid elements.

4,537,476

RETRO-FOCUS TYPE WIDE ANGLE LENS

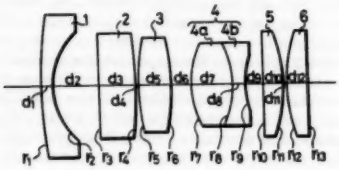
Yusuke Nanjo, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 1, 1983, Ser. No. 528,628

Claims priority, application Japan, Sep. 6, 1982, 57-154822

Int. Cl.³ G02B *13/04*

U.S. Cl. 350—461 **1 Claim**



1. A retro-focus type wide angle lens system having an optical axis, an object side and an image side and an angle of view within the range of 60° to 70°, comprising:

in succession from the object side, a first negative meniscus lens component having a convex surface facing the object side;

a second positive lens component;

a third biconvex lens component;

a fourth negative doublet component formed of a positive biconvex lens and a negative biconcave lens and having an object-side lens surface and an image-side lens surface;

a fifth positive lens component having a convex surface facing the image side; and

a sixth positive lens component having a convex surface facing the object side,

the lens system satisfying the conditions:

$$1.3f<|f_1|<2f$$

$$d_2+d_3+d_4<2f$$

$$v_2<40$$

$$1.2<r_7/r_9<2$$

where f_1 is the focal length of said first lens component, d_2 is the distance along the optical axis between said first and second lens components, d_3 is the thickness along the optical axis of said second lens component, and d_4 is the distance along the optical axis between said second and third lens components, v_2 is an Abbe number of said second lens component, and r_7 and r_9 are curvature radii of said object-side and image-side lens surfaces, respectively, of said fourth lens component.

4,537,477

SCANNING ELECTRON MICROSCOPE WITH AN OPTICAL MICROSCOPE

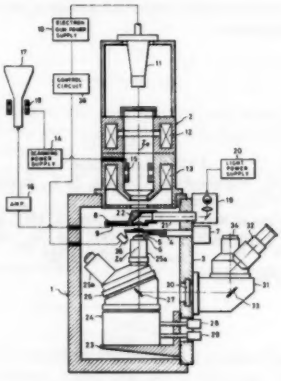
Toshijiro Takagi, and Eiji Watanabe, both of Tokyo, Japan, assignors to JEOL Ltd., Tokyo, Japan

Filed Mar. 2, 1983, Ser. No. 471,440

Claims priority, application Japan, Mar. 5, 1982, 57-30940; Apr. 9, 1982, 57-51532

Int. Cl.³ G02B *21/00, 21/06, 21/26;* H01J *37/26*

U.S. Cl. 350—507 **5 Claims**



1. A scanning electron microscope comprising:

(a) a specimen chamber having a removable front cover;

(b) an electron gun for creating an electron beam;

(c) means for coverging the electron beam to a spot on a specimen;

(d) means for scanning the spot of the electron beam over the specimen;

(e) a detector for generating a signal in response to the electron beam spot scanning over the specimen;

(f) image means for displaying an image in response to the signal from said detector by modulating a CRT beam scanned in synchronism with the electron beam spot scanning said specimen;

(g) a specimen moving mechanism for supporting and moving the specimen in the specimen chamber said mechanism being supported from said front cover;

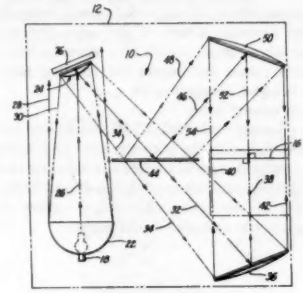
(h) slide support means for illuminating the specimen with light in the direction in which the electron beam irradiates the specimen, said detector being mounted on said slide support in said specimen chamber for detecting backscattered and/or secondary electrons from the specimen; and

(i) an optical microscope having an objective lens unit disposed adjacent to the specimen moving mechanism along the optical axis in said specimen chamber for receiving light passed through the specimen, and an eyepiece unit disposed outside of said specimen chamber for receiving the light having passed through said objective lens, said objective lens unit and eyepiece unit supported from said front cover.

4,537,478
APODIZED MIRROR OPTICAL SYSTEM

Thomas A. Richter, 640 19th St., Manhattan Beach, Calif. 90266

Filed Jan. 19, 1984, Ser. No. 571,924
Int. Cl.³ G02B 5/10; F21M 3/20
U.S. Cl. 350—611 14 Claims

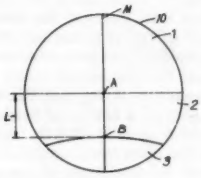


1. An optical system comprising:
a lamp, a reflector positioned with respect to said lamp to provide a beam of illumination;
a petal mirror on the path of said beam to reflect the beam;
a collimating mirror on the path of the reflected beam;
an exposure plane, said collimating mirror directing the reflected beam toward the exposure plane as a collimated beam, said petal mirror being adjusted so as to provide substantially uniform illumination intensity across said exposure plane.

4,537,479
PROGRESSIVE MULTIFOCAL OPHTHALMIC LENS

Toshihide Shinohara, and Sakiho Okazaki, both of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Sep. 10, 1984, Ser. No. 648,913
Claims priority, application Japan, Sep. 16, 1983, 58-170647; Apr. 6, 1984, 59-68648; Jun. 7, 1984, 59-117210; Jun. 7, 1984, 59-117211
Int. Cl.³ G02C 7/06
U.S. Cl. 351—169 12 Claims



1. A progressive multifocal ophthalmic lens comprising first and second refractive surfaces facing each other, said first refractive surface having upper and lower portions and including a far vision viewing zone in said upper portion for viewing mainly distant objects, a near vision viewing zone in said lower portion for viewing mainly nearby objects, and an intermediate vision viewing zone for viewing mainly intermediate objects between said far and near vision viewing zones, said intermediate vision viewing zone having an intermediate vision viewing zone central portion and said near vision viewing zone having a near vision viewing zone central portion, said first refractive surface having a principal meridian curve extending vertically in the general center of said far, intermediate and near vision viewing zones, the surface power along said principal meridian curve in said intermediate vision viewing zone progressively increasing from a far vision viewing zone reference focal power (D1 diopter) to a near vision viewing zone reference focal power (D2 diopter), and an additional power Ad [Ad=D2−D1] of said first refractive surface being about 1.5 diopter or more, said intermediate vision viewing zone central portion and said near vision viewing zone central portion extending on opposite sides of said principal meridian curve,

the principal curvatures at each arbitrary point on said first refractive surface being C1 and C2, each point on said first refractive surface in said intermediate vision viewing zone central portion satisfying the condition:

$$|C1-C2| \leqq 1/(N-1)\ (m^{-1}),$$

wherein $m^{-1}=1$/meters, and each point on said first refractive surface in said near vision viewing zone central portion satisfying the conditions:

$$|C1-C2| \leqq 1/(N-1)(m^{-1})$$

$$\frac{D_2-0.5}{N-1} \leqq \frac{C_1+C_2}{2} \leqq \frac{D_2+0.5}{N-1}\ (m^{-1}),$$

where N is the refractive index of the lens material,

the minimum width of said intermediate vision viewing zone central portion and the maximum width of said near vision viewing zone central portion being S(mm) and W(mm), respectively,

said minimum width S and said maximum width W satisfying the conditions:

$$W \leqq 30/A\ (mm)$$

$$W \leqq 1.5 \times S\ (mm),$$

where A is the value of the additional power Ad expressed in units of diopter,

and the gradient of the variation of the surface power at each arbitrary point along said principal meridian curve is G(diopter/mm),

every point along said principal meridian curve in said intermediate vision viewing zone satisfying the condition:

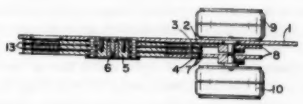
$$G \leqq Ad/18\ (diopter/mm),$$

where Ad is the additional power in units of diopter.

4,537,480
MOTOR-DRIVEN SUBJECTIVE PHOROMETER

Hayao Akaba; Takeshi Yamada, and Masahiro Jinbo, all of Tokyo, Japan, assignors to Hoya Lens Corporation, Tokyo, Japan

Filed Jun. 1, 1983, Ser. No. 500,069
Claims priority, application Japan, Jun. 25, 1982, 57-109451
Int. Cl.³ A61B 3/02
U.S. Cl. 351—235 1 Claim



1. In a subjective phorometer having two eye heads, each eye head having a first rotatable spherical lens plate, a second rotatable spherical lens plate, a first rotatable toric lens plate, a second rotatable toric lens plate and a rotatable accessory lens plate, the improvement comprising: means on each eye head for rotating the first spherical lens plate and the accessory lens plate comprising a first D-C motor for each lens plate and gear means engaging the motors and plates; means on each eye head

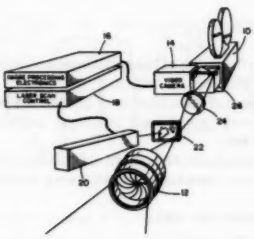
for rotating the second spherical lens plate comprising a first electromagnetic clutch with a double shaft mechanism for engaging the gear means for the first spherical lens plate or the accessory plate to rotate therewith; means on each eye head for rotating the first and second toric lens plates comprising a second D-C motor, a second electromagnetic clutch, gear means for alternatively engaging the first and second toric lens plates to effect rotation by the second D-C motor, a third D-C motor and gear means for effecting rotation the two toric lens plates together by the third motor; means for raising and lowering one eye head comprising a fourth D-C motor and gear means engaging the one eye head and the fourth motor; means for sliding the two eye heads towards and away from each other comprising a fifth D-C motor and gear means engaging the two eye heads with the fifth motor; means for rotating each eye head for converging motion comprising a sixth motor and gear means for each eye head to engage same with the sixth motor; first control switches settable to correspond to vision data; second control switches for effecting desired movement of the lens plates; central processing means receptive of the vision data from the first switches and for controlling the motors and electromagnetic clutches in response to the second switches; a monitor for digitally displaying vision data; and a printer for printing out vision data.

4,537,481

PROCESS AND APPARATUS FOR CREATING TRAVELING MATTES

Craig D. Witty, 645 Ash St., Winnetka, Ill. 60093

Filed Nov. 1, 1982, Ser. No. 438,165
Int. Cl.³ G03B *21/32*; A63J *5/00*
U.S. Cl. 352—89 **9 Claims**



1. A system for creating traveling mattes for special-effects cinematography comprising:
(a) photographic recording means for recording an image:
(b) electronic camera means:
(c) means for transmitting said image to said electronic camera means so that the photographic recording means and the electronic camera means receive the same image;
(d) light valve means for selectively modulating the light received by said photographic recording means;
(e) means for generating an image on said light valve means whereby the light received by said photographic recording means is selectively modulated; and,
(f) control means for controlling said means for generating an image responsive to said camera means
whereby the image received by said electronic camera means can be transmitted to said light valve means to modulate the light received by said photographic recording means.

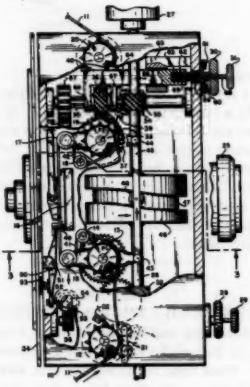
4,537,482

MOTION PICTURE FILM MOVEMENT APPARATUS

Lewis Weiner, 8708 Santiago St., Holliswood, N.Y. 11423

Filed Dec. 29, 1983, Ser. No. 566,665
Int. Cl.³ G03B *1/24*
U.S. Cl. 352—186 **12 Claims**

1. An apparatus for intermittently moving film through a film gate in a manner to provide a dwell time for each film frame, greater than one-half the period of a complete cycle, comprised of the dwell time and the transport time involved in moving the film from one frame to the next, said apparatus including, in combination:
(a) first and second rollers;
(b) means for feeding film to said first roller and taking up film from said second roller including a first sprocket wheel about which film to be fed to said first roller passes, a second sprocket wheel of the same size as said first sprocket wheel about which film taken up from said second roller passes and means for rotating said sprocket wheels at equal constant rates;
(c) first and second arms;
(d) means pivoting said arms at first and second pivot points coinciding respectively with the axes of rotation of said first and second sprocket wheels, extending ends of said arms mounting said rollers so that back and forth swinging movement of said arms moves said rollers along arcs defining a given path and a return path;



(e) a rotatable member having a camming means on its periphery following a direction constituting a function of the rate of movement of the rollers along said given path and return path; and
(f) a cam follower connected to the ends of said first and second pivot arms opposite the extending ends on the other side of said pivot points movable by said camming means in a repititive pattern in response to rotation of said member, said first and second rollers being rocked back and forth by action of said cam follower in unison along said given path for a first given period during which the first roller takes up all film fed to it and the second roller releases all film taken from it and in unison along a return path to their original positions during a second given period less than said first given period whereby film in said film gate is stationary during said first given period and moved through said gate from one frame to the next within said second given period.

4,537,483

OPTICAL PROJECTION VIEWING SYSTEM

Roger S. Turner, 620 Carpenter La., Philadelphia, Pa. 19119

Filed May 21, 1984, Ser. No. 612,646
Int. Cl.³ G02B *21/36*
U.S. Cl. 353—39 **19 Claims**

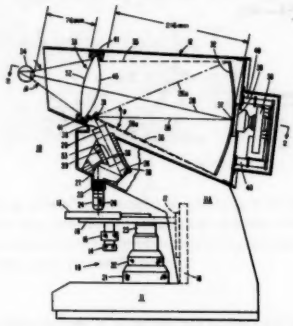
1. An optical projection viewing system comprising:
a viewing housing,
an objective lens juxtaposed an object to be viewed,
a relay projection lens in said viewing housing for projecting

a wide field image from said object from said objective lens,

a viewing screen in said viewing housing having a full field image projected thereon,

a non-symmetric biocular viewing lens in said viewing housing intermediate said imaging screen and a person viewing said full image on said imaging screen,

said biocular viewing lens having non-symmetric front and rear biconvex surfaces,



said biconvex surfaces having different radius of curvature, whereby the light path distance from a point on said viewing screen to the eyes of the person viewing said screen is different and the field distance correction provided by said non-symmetric biconvex biocular viewing lens provides a uniform field distance to both eyes within one eighth of one diopter over said field of image.

4,537,484

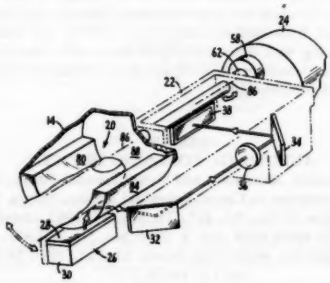
FINGERPRINT IMAGING APPARATUS

Randall C. Fowler, Los Altos, Calif.; Kenneth Ruby, Florence, and Thomas F. Sartor, Jr., Eugene, both of Oreg., assignors to Identix Incorporated, Palo Alto, Calif.

Filed Jan. 30, 1984, Ser. No. 575,842

Int. Cl.³ G03B *29/00*

U.S. Cl. 354—62 **9 Claims**



1. A fingerprint imaging apparatus comprising:

a frame;

a carriage rotatably mounted on said frame;

motor drive means for rotatably driving said carriage;

a transparent optical element secured to said frame for receiving a finger to be imaged;

a light source secured to said carriage which directs light towards said optical element; and

a light detector secured to said carriage which receives light from said optical element, the position of said light detector being fixed with respect to said light source.

4,537,485

AUTOMATIC DEVELOPING MACHINE

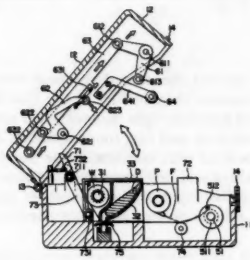
Kaneo Saito, Hino, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Oct. 20, 1983, Ser. No. 543,823

Claims priority, application Japan, Oct. 25, 1982, 57-188015

Int. Cl.³ G03D *5/02*

U.S. Cl. 354—304 **6 Claims**



1. A photographic developing machine comprising a light-tight housing (11);

a rotatable drum (511) within said housing; and

winding means operable to wind onto said drum (511) a length of exposed photosensitive material (F) in area contact with a guide web (W) coated with a gelatinous processing agent (D) and to rewind the developed said photosensitive material (F) and the used guide web (W) from said drum (511) into respective individual locations (P,31);

characterized in that:

said winding means comprises electric motor means;

and by an overload detector (531,532,300) operable to detect an overload condition imposed on said electric motor means, said overload condition being representative of completion of a said winding operation onto said drum (511);

means (55,$S_{2\text{-}1}$, $S_{2\text{-}2}$) associated with said overload detector (531,532,300) and responsive to detection of a said overload condition to stop a said winding operation of said electric motor means and to start operation of a timer (T) to time a predetermined development time; and

means (S_3) responsive to said timer (T) to initiate a said rewinding operation by said electric motor means after elapse of said predetermined development time.

4,537,486

APPARATUS FOR THE EXPOSURE AND DEVELOPMENT OF PHOTOGRAPHIC IMAGES

Immo Boie, Niederkassel; Hermann Lührig, Leverkusen, and Guido Kovacic, Unkel, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 497,087, May 23, 1983,. This application Apr. 2, 1984, Ser. No. 595,826

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1982, 3220912

Int. Cl.³ G03D *9/00, 3/16*

U.S. Cl. 354—317 **11 Claims**

1. In an apparatus for development of photographic images the combination comprising,

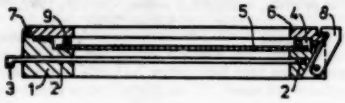
a frame means adapted to hold a laminated monosheet material having a first member defining an opening and provided with a lateral surface extending inwardly from the frame into the opening, and forming a shoulder

for receiving a photosensitive side of said monosheet material,

a seal means seated over the monosheet material,

a second frame member hinged to one side of the first frame member and defining an opening substantially coextensive with the opening defined by said first frame member,

means for lockably attaching the first and second frame members together



whereby the seal means and the monosheet material are pressed against the shoulder in the first frame in a light proof and moisture tight manner when said second member is locked to said first frame member, and

means associated with said first frame member and located on the side of said first frame member most adjacent to the photosensitive layer of said monosheet material

and being able to protect said photosensitive layer against light.

4,537,487

AUTOMATIC FOCUS CONTROL SYSTEM WITH BACKLASH CORRECTING ARRANGEMENT

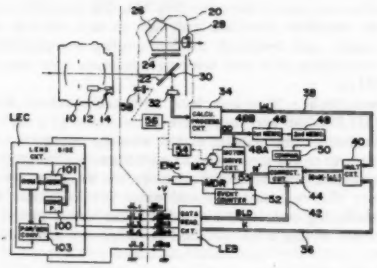
Nobuyuki Taniguchi, Tondabayashi; Norio Ishikawa, and Takeshi Egawa, both of Osaka, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 29, 1984, Ser. No. 646,380

Claims priority, application Japan, Sep. 1, 1983, 58-161393; Nov. 4, 1983, 58-207758; Jul. 2, 1984, 59-137570

Int. Cl.³ G03B *3/10*

U.S. Cl. 354—400 **10 Claims**



1. An automatic focus control system which comprises means for detecting an amount of deviation of a position of an image of a target object to be photographed formed by an objective lens with respect to a predetermined focal plane, a calculating circuit for calculating a driving amount of a focusing control driving motor required for driving a focusing optical system of the objective lens up to an in-focus position based on a result of the detection by said detecting means, a drive control circuit for controlling the driving motor based on data of the driving amount calculated by said calculating circuit, a transmission mechanism for transmitting the driving force of the driving motor to the focusing optical system of the objective lens, an output circuit for producing data of an amount of backlash in said transmission mechanism, a direction detecting circuit for detecting alteration of the driving direction by said driving motor, and a correction circuit for correcting the driving amount data by the backlash amount data of said output circuit in response to the driving direction alteration detecting signal from said direction detecting circuit.

4,537,488

CAMERA SYSTEM

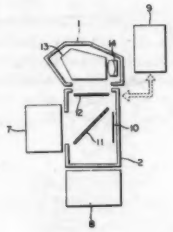
Nobuhiko Terui, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Feb. 22, 1984, Ser. No. 582,636

Claims priority, application Japan, Mar. 1, 1983, 58-29419[U]

Int. Cl.³ G03B *3/00, 7/28, 13/02*

U.S. Cl. 354—402 **6 Claims**



1. A camera system for exposing a photographic film to an image of a photographic object, which comprises in combination:

(a) an optical device for focusing the image of the photographic object on a predetermined plane;

(b) a camera body, in which said photographic film is disposed in a predetermined plane, said camera body being detachably mounted on said optical device, and including a first power source, exposure control means for controlling exposure on said film by application of a voltage from said first power source, and a voltage detection means for detecting a voltage to be applied to said exposure control means from said first power source, said voltage detection means producing a detection signal when the voltage as detected is lower than a predetermined voltage level; and

(c) a view-finder device for observing the image of the photographic object on said predetermined plane, said device being detachably mounted on said camera body, and including a second power source, focus detection means operable for detecting a focused state of the image of the photographic object on said predetermined plane by application of a voltage from said second power source, and means for introducing said detection signal from said camera body, said focus detection means stopping its operation in response to said detection signal.

4,537,489

AUTOMATIC FOCUSING DEVICE

Ryoichi Suzuki, Kanagawa, and Ryuji Tokuda, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 407,478, Aug. 12, 1982, abandoned. This application Apr. 9, 1984, Ser. No. 597,587

Claims priority, application Japan, Aug. 21, 1981, 56-131080

Int. Cl.³ G03B *3/10*

U.S. Cl. 354—403 **6 Claims**

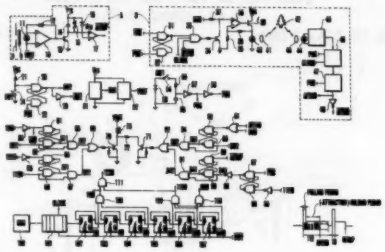
1. An active type automatic focusing device having signal projecting means and electromagnetic means for initiating a focal point adjusting action, the automatic focusing device comprising:

signal producing means for producing a control signal;

first power supply means for effecting a power supply for operating said projecting means, said first power supply means being arranged to begin to effect the power supply to said signal projecting means in response to the signal produced from said signal producing means; and

second power supply means for effecting a power supply for

actuating said electromagnetic means, said second power supply means being arranged to effect the power supply to said electromagnetic means until the signal is produced from said signal producing means wherein said signal



producing means is arranged to produce said signal after the lapse of a period of time long enough for allowing said electromagnetic means to complete an action for initiating said focal point adjusting action.

4,537,490

APPARATUS AND METHOD FOR ELECTROPHOTOGRAPHICALLY PRODUCING COPY HAVING CONTINUOUS-TONE AND OTHER CONTENT

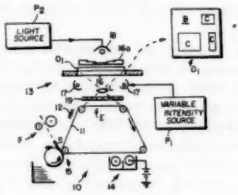
Michael D. Stoudt, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 493,868, May 12, 1983, Pat. No. 4,472,047. This application Jun. 4, 1984, Ser. No. 617,047

The portion of the term of this patent subsequent to Sep. 18, 2001, has been disclaimed.

Int. Cl.[3] G03G *15/04*

U.S. Cl. 355—3 R **7 Claims**



4. In electrophotographic apparatus in which a photoconductor sector is moved along an operative path past: (a) primary charging means, (b) first support means for supporting a continuous tone original, (c) exposing means for producing a half-tone-screened light image of an original on said first support means on said photoconductor sector and (d) means for developing the electrostatic image on said photoconductor sector, characterized as further including: (i) second support means for accurately positioning another original that is complementary to said continuous tone original, in a location which is registered relative to said operative path, (ii) exposing means for exposing said photoconductor sector to the unscreened light image of the positioned complementary original and (iii) means for synchronizing said first and second exposing means and the movement of said sector so that the image exposures are in predetermined register on said sector.

4,537,491

DEVELOPMENT APPARATUS FOR DEVELOPING LATENT ELECTROSTATIC IMAGES

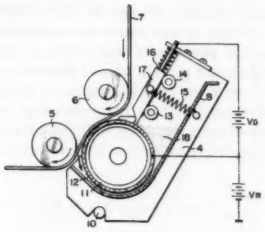
Kenya Komada, Yokohama; Kazuhiro Yuasa, Zama, and Shiroh Kondoh, Sagamihara, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 13, 1982, Ser. No. 434,005

Claims priority, application Japan, Oct. 20, 1981, 56-167737; Nov. 26, 1981, 56-189523; Mar. 31, 1982, 57-50982

Int. Cl.[3] G03G *15/09*

U.S. Cl. 355—3 DD **8 Claims**



1. In a development apparatus for developing latent electrostatic images borne by a belt-shaped flexible recording medium to visible or transferable images by a rotatable development roller which carries toner thereon and supplies the toner to said recording medium for developing the latent electrostatic images, the improvement wherein said development roller comprises a non-magnetic, cylindrical sleeve and a magnetic roller disposed within said non-magnetic cylindrical sleeve, said non-magnetic cylindrical sleeve and said magnetic roller each capable of being driven in rotation relative to the other, the ratio of the peripheral rotary speed of said non-magnetic cylindrical sleeve or said magnetic roller to the peripheral rotary speed of said recording medium is in the range of 1.5 to 2.5, said toner carried on said development roller is regulated to a predetermined thickness by a doctor blade, and said belt-shaped flexible recording medium is in arc-contact with said development roller.

4,537,492

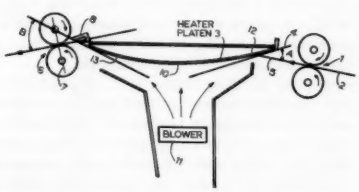
HEATER-DRIER FOR FUSING TONER IMAGES ON WET PRINTING PLATES

Juergen G. Lein, West Henrietta, and Daniel H. Robbins, Rochester, both of N.Y., assignors to Itek Corporation, Lexington, Mass.

Filed Jul. 7, 1983, Ser. No. 511,693

Int. Cl.[3] G03G *15/20*

U.S. Cl. 355—3 FU **6 Claims**



1. Fuser drier for fixing toner images upon wet cut relatively stiff sheets having a beam flexure strength and resiliency substantially greater than the beam flexure strength and resiliency of electrostatic copy paper comprising:

a. a vacuum curved platen for heating said relatively stiff sheets to fix said image;

b. a first entrance roller drive means for directing the lead edge of said sheets at a first acute angle of between 10° and 50° with respect to a first surface portion of said platen for maintaining substantial lead edge portions of said sheets in intimate contact with said first portion of said platen by virtue of said first acute angle and the resiliency of said sheets and;

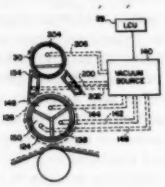
c. a second exit roller drive means for withdrawing said sheets from said platen in a direction forming a second acute angle between 10° and 50° with respect to a second surface portion of said platen for maintaining substantial trailing edge portions of said sheets in intimate contact with said second portion of said platen, by virtue of said second acute angle and said resiliency of said sheets, said first and second surface portions being separated by a third curved surface portion for contacting major centralized portions of said sheets to fix the toner images thereon.

4,537,493

COPY SHEET POSITIONING APPARATUS

Matthew J. Russel, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 1, 1984, Ser. No. 575,966
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 SH **5 Claims**



1. In electrographic apparatus which produces copies on copy sheets of at least first and second dimensions and which includes a moving image transfer member upon which transferable unfixed images are formed, copy sheet positioning apparatus comprising:

first sheet handling means located adjacent to said image transfer member for defining a first path for a copy sheet of said first dimension, said first sheet handling means operating to remove said copy sheet of said first dimension from transferable relationship with said image transfer member after transfer of one unfixed image to said sheet of said first dimension and to reposition said copy sheet in transferable relationship with a successive unfixed image on said image transfer member wherein said removing and repositioning is effected without contacting said first unfixed image on said copy sheet; and

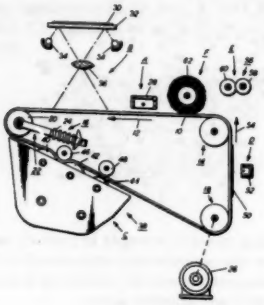
second sheet handling means for defining with said first sheet handling means a second path for a copy sheet of said second dimension, said second sheet handling means cooperating with said first sheet handling means to remove said copy sheet of said second dimension from transferable relationship with said image transfer member after transfer of one unfixed image to said copy sheet and to reposition said copy sheet in transferable relationship with a successive unfixed image on said image transfer member, wherein said removing and repositioning is effected without contacting said first unfixed image on said copy sheet.

4,537,494

MULTI-ROLL DEVELOPMENT SYSTEM

Anthony R. Lubinsky, Webster; Gary A. Denton, Rochester; Paul D. Keller, Rochester, and James E. Williams, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 26, 1984, Ser. No. 574,114
Int. Cl.³ G03G *15/08*
U.S. Cl. 355—3 DD **16 Claims**



1. An apparatus for developing a latent image recorded on a flexible member with a developer material, including:

first means, positioned closely adjacent to the flexible member defining a first development zone therebetween, for transporting the developer material into contact with the flexible member in the first development zone;

second means, spaced from said first transporting means and positioned closely adjacent to the flexible member defining a second development zone therebetween, for transporting the developer material into contact with the flexible member in the second development zone;

means for maintaining the flexible member, in the region of at least the first development zone and the second development zone, at a preselected tension of sufficient magnitude so that the developer material being transported into contact with the flexible member, in at least the first development zone and the second development zone, deflects the flexible member about said first transporting means and said second transporting means to form a wrapped first development zone and a wrapped second development zone; and

third means, spaced from said second transporting means and positioned closely adjacent to the flexible member defining a third development zone therebetween, for transporting developer material into contact, in at least the third development zone, with the flexible member, said third transporting means receiving developer material from said second transporting means forming a blanket of developer material therebetween, said first transporting means, said second transporting means and said third transporting means transporting developer material into contact with the latent image recorded on the flexible member to optimize development thereof.

4,537,495

MULTISPEED DEVELOPMENT SYSTEM

John J. Kopko, Macedon, N.Y., assignor to Zerox Corporation, Stamford, Conn.

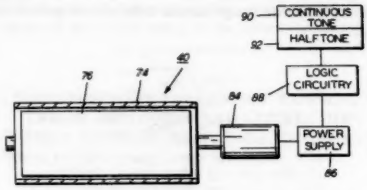
Filed Jul. 1, 1983, Ser. No. 510,123
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 DD **12 Claims**

1. An apparatus which develops continuous tone and halftone latent images recorded on a flexible belt, including:

means, positioned closely adjacent to the flexible belt defining a development zone therebetween, for transporting developer material into contact with the flexible belt in

the development zone so as to develop the latent image recorded thereon;

means for maintaining the flexible belt at a preselected tension of sufficient magnitude so that the developer material being transported into contact therewith deflects the



flexible belt about said transporting means to form a wrapped development zone; and

means for controlling the speed of said transporting means so that said transporting means moves at a higher speed when developing continuous tone latent images than when developing half-tone latent images.

4,537,496

METHOD OF REPLENISHING A DEVELOPER FOR PHOTOSENSITIVE PLATE

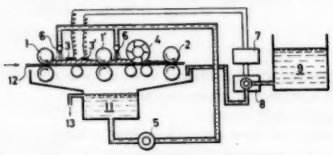
Hisao Ohba; Toshio Uchida; Azusa Ohashi, and Nobuyuki Kita, all of Shizuoka, Japan, assignors to Fuji Photo Film Company, Limited, Kanagawa, Japan

Filed Nov. 22, 1982, Ser. No. 443,831

Claims priority, application Japan, Nov. 30, 1981, 56-192429

Int. Cl.³ G03F *7/00*

U.S. Cl. 355—10 **21 Claims**



1. A method of replenishing a source of developer compound for an automatic image developing machine which develops images upon a plurality of pre-exposed photosensitive plates by depositing said developer compound on said plates as said plates are transported through said machine, said method comprising the steps of:

sensing a residual amount of a photosensitive layer remaining on said photosensitive plates a predetermined period of time after said plates are coated with said developer compound; and

sending a predetermined quantity of a replenisher developer compound to said source of developer compound when said residual amount of said photosensitive layer exceeds a predetermined level.

4,537,497

IMAGE RECORDING APPARATUS

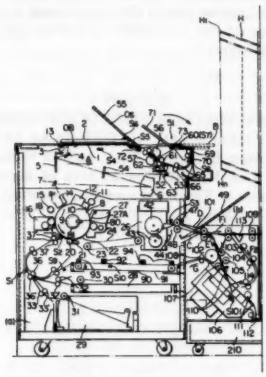
Shunichi Masuda, Wakabayashi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 15, 1982, Ser. No. 449,843

Claims priority, application Japan, Dec. 21, 1981, 56-205175; Dec. 21, 1981, 56-205176

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—14 R **13 Claims**



1. An image recording apparatus comprising:

recording means for recording an image on a sheet, said recording means being capable of operating in a first mode and a second mode different from the first mode;

feeding means for feeding the sheet to said recording means so as to allow overlay recording on the same side of the sheet on which an image has been previously recorded by said recording means; and

controlling means for controlling said recording means and said feeding means such that after image recording is performed on a desired number of sheets in the first mode, the overlay recording of an image on the same sides of the sheets is allowed in the second mode, and wherein said first and second modes are maintained, once they are commenced, until the image recording or the overlay image recording on the desired number of sheets is completed.

4,537,498

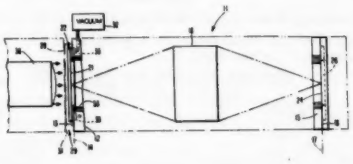
FOCAL PLANE ADJUSTED PHOTOMASK AND METHODS OF PROJECTING IMAGES ONTO PHOTOSENSITIZED WORKPIECE SURFACES

Edward L. Banks, Allentown; Thomas S. Ellington, IV, Emmaus, and Terrence E. Zavecz, Alburtis, all of Pa., assignors to AT&T Technologies, Inc., New York, N.Y.

Filed May 3, 1984, Ser. No. 606,561

Int. Cl.³ G03B *27/52*

U.S. Cl. 355—55 **11 Claims**



1. A photomask for use in a projection printer, comprising:

a substrate having a major surface in a plane and a pattern of projectable object features on such surface;

a transparent coverplate positioned over the pattern and

attached to the substrate, such coverplate having a predetermined thickness and an index of refraction greater than unity, thereby causing a shift by a predetermined distance of an object plane along an optical path of such projection printer upon insertion of the photomask therein; and

mounting surfaces disposed on the substrate in regions of the substrate adjacent to support surfaces of a mounting chuck in the projection printer upon insertion of the photomask into the projection printer, such mounting surfaces being located in a plane parallel to, and offset from, the plane of the pattern by a distance equal to the predetermined distance by which the object plane is shifted due to a presence of the coverplate in the optical path of the projection printer.

4,537,499

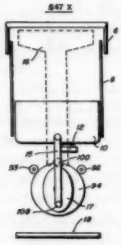
IMAGING SYSTEM FOR PRODUCING REDUCED OR ENLARGED IMAGES OF AN ORIGINAL DOCUMENT

Joachim A. Ritter; Edward C. Bock, both of Webster; Richard A. Spinelli, and John R. Dennis, both of Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 21, 1983, Ser. No. 477,193

Int. Cl.³ G03B *27/36*

U.S. Cl. 355—58 **4 Claims**



1. An imaging system for providing, at an image plane, reduced or enlarged images of a document, said system comprising:

an enclosed light housing which comprises fixed side walls, a transparent platen assembly forming the top document-supporting surface of said housing, said platen assembly adapted to be vertically translated in light-tight sliding contact with the interior surface of said side walls and a floor assembly forming the bottom surface of said housing, said floor assembly adapted to be vertically translated in light-tight sliding contact with the interior surfaces of said side walls,

a projection lens mounted in said floor assembly,

means for simultaneously translating said platen assembly and said floor assembly in response to a particular document magnification selection, and

flash illumination means within said housing to provide substantially uniform illumination of said platen.

4,537,500

PHOTOGRAPHIC CONTRAST CONTROL DEVICE

John C. Nemesnyik, Nutley, N.J., assignor to Charles Beseler Company, Florham Park, N.J.

Filed Jan. 19, 1984, Ser. No. 571,996

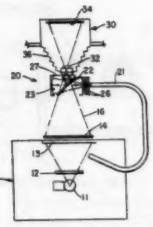
Int. Cl.³ G03B *27/54*

U.S. Cl. 355—67 **17 Claims**

1. A photographic contrast control device for use with apparatus having a light source that creates a cone of light forming an image, which light is directed along a path from the image source through a lens onto film while the film is simultaneously partially fogged by diffused light which is substantially colinear with the light from the image, comprising:

a partial mirror means positioned diagonally across the path of the cone of light travelling to the lens so that one side generally faces the image source and one side generally faces the lens, said partial mirror means being at least partially transmissive to light directed onto the side facing the image source and at least partially reflective to light directed onto the side facing the lens;

diffuse light means for directing diffuse light at substantially a right angle to the light path through said partial mirror means from the image source side of said partial mirror; and



reflecting means for reflecting the diffuse light from said diffuse light means after it has passed through said partial mirror means and forming it into a cone of light approximating the cone of light from the image source, the cone of light from said reflecting means being directed onto said partial mirror means and being reflected thereby into the lens such that it is colinear with the cone of light from the image source.

4,537,501

APPARATUS FOR THE ATTITUDE CONTROL OF PLATE-FORM BODY

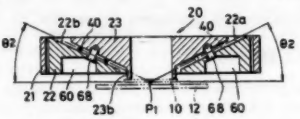
Yukio Kakizaki, Yokohama; Hisao Izawa, and Junji Hazama, both of Kawasaki, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Feb. 17, 1984, Ser. No. 581,049

Claims priority, application Japan, Feb. 22, 1983, 58-28336

Int. Cl.³ G03B *27/62, 27/64*

U.S. Cl. 355—76 **10 Claims**



1. Apparatus for the attitude control of a plate-form body placed on a reference plane comprising:

(a) support table means;

(b) at least two first spring members arranged on said support table means at different positions including two positions opposed to each other relative to one of the axes of rectangular coordinates on said reference plane;

(c) first movable stage means placed on said support table means through said first spring members;

(d) first driving means for producing a displacement of said first movable stage means at different positions including two positions opposed to each other relative to said one coordinate axis and in the direction tangent to a circle described normally to said one coordinate axis with the center of the circle being on said one coordinates axis;

(e) at least two second spring members arranged on said first movable stage means at different positions including two positions opposed to each other relative to the other axis of said rectangular coordinates;

(f) second movable stage means placed on said first movable stage means through said second spring members, said

second stage means including means for holding said plate-form body on said reference plane containing the origin of said rectangular coordinates; and

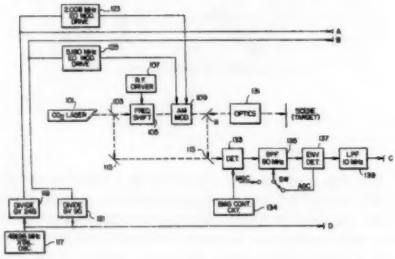
(g) second driving means for producing a displacement of said second movable stage means at different positions including two opposed positions relative to the other coordinate axis and in the direction tangent to a circle described normally to the other coordinate axis with the center of the circle being on the other coordinate axis.

4,537,502

MULTIPLE DISCRETE FREQUENCY RANGING WITH ERROR DETECTION AND CORRECTION

David D. Miller, Seattle, and John N. Polky, Kent, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Sep. 30, 1982, Ser. No. 428,550
Int. Cl.³ G01C 3/08; G01S 13/38; G06F 7/72
U.S. Cl. 356—5 **9 Claims**



1. Range determination apparatus for determining target range within a range depth of D and within a range bin error of e comprising:

(a) a carrier frequency transmitter for transmitting a carrier frequency,

(b) means for generating at least two modulating signals having frequency f_1 and f_2 respectively,

(c) modulation means coupled to said carrier frequency transmitter for modulating said carrier, said modulation means operative for said at least two discrete frequencies f_1 and f_2 for providing one of simultaneous or sequential modulated signals,

(d) said at least two modulating frequencies and a common sub-multiple counting frequency f_o related such that

$$f_o m_1' f_1 = m_2' f_2$$

where,

$$m_1' = m_1 m_r$$

$$m_2' = m_2 m_r$$

$$m_r \cong 4e+1$$

$$m_1 m_2 \cong D/m_r$$

and where m_1,m_2 and m_r are pairwise relatively prime,

(e) a receiver for receiving a reflected signal from said target and for producing a received electrical signal corresponding thereto,

(g) phase detection means responsive to said modulating signals of said generating means and said received signals for detecting the phase difference x_1' and x_2' respectively between the modulating signals of frequencies f_1 and f_2 and each of the corresponding received signals,

(h) data processing means coupled to receive said detected phase differences for each of said received signals, said data processing means operative

(1) to calculate

$$R(x_1')_{m1},\ R(x_2')_{m2}$$
$$R(x_1')_{mr},\ R(x_2')_{mr}$$

where $R(x)_m$ is defined as the residue of x modulo m,

(2) to compare $R(x_1')_{mr}$ with $R(x_2')_{mr}$ and if unequal to modify at least one of x_1' and x_2' by adding or subtracting an integer $\cong e$ to produce modified phase differences x_1'' and x_2'' so that residues $R(x_1'')_{mr}$ and $R(x_2'')_{mr}$ of the modified phase differences are equal, and

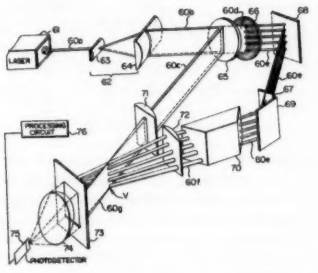
(3) to decode one of (1) the residue number triplet $[R(x_1')_{m1}, R(x_2')_{m2}, R(x_1')_{mr}]$ and the modified residue number triplet $[R_1'')_{m1}, R(x_2'')_{m2}, R(x_1'')_{mr}]$ relative to the moduli set $[m_1,m_2,m_r]$ to obtain the target range.

4,537,503

MULTIPLE MEASURING CONTROL VOLUME LASER DOPPLER ANEMOMETER

Dirkson D. S. Liu, Ottawa, Canada, assignor to Atomic Energy of Canada Limited, Ottawa, Canada

Filed Sep. 10, 1982, Ser. No. 417,191
Claims priority, application Canada, Dec. 22, 1981, 393182
Int. Cl.³ G01P 3/36
U.S. Cl. 356—28.5 **8 Claims**



1. A multiple measuring-control volume laser Doppler anemometer comprising:

laser means for generating an optical beam;

means for transforming the optical beam to produce a number V of measuring control volumes wherein each control volume has two focussed optical beams intersecting at a unique predetermined angle ϕ, wherein the angles ϕ_1, ϕ_2, . . . ϕ_n for the different control volumes each differ from one another, the optical beam transforming means having:

means for broadening the optical beam into an elongated beam;

means for splitting the elongated beam into a first elongated beam and a second elongated beam;

means for gating the first elongated beam into V parallel beams; and

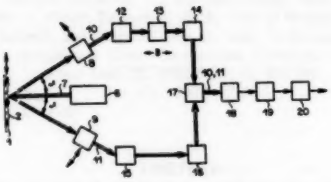
means for causing the second elongated beam to intersect with the V parallel beams to form the control volumes; and

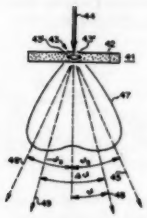
means for detecting the scattered light from measuring control volumes for determining the velocity at each of the control volumes.

4,537,504
SECURITY BLANK WITH ENHANCED AUTHENTICATING FEATURES, AND A METHOD AND AN APPARATUS FOR DETERMINING THE GENUINENESS OF THE SECURITY BLANK

Heinrich P. Baltes; Andrew S. Glass, both of Zug, and Karl Jauch, Le Lignon, all of Switzerland, assignors to LGZ Landis & Gyr Zug AG, Zug, Switzerland

Filed Jan. 25, 1982, Ser. No. 342,065
Claims priority, application Switzerland, Feb. 3, 1981, 720/81; Apr. 16, 1981, 2559/81; Sep. 23, 1981, 6126/81
Int. Cl.[3] G06K *7/10*
U.S. Cl. 356—71 47 Claims





1. In a method of determining the genuineness of a security blank having a light redirecting spatial structure establishing at least one authenticating feature, said method including illuminating said spatial structure, forming from light scattered from said spatial structure two narrow bundles of light rays, and converting said two bundles of light rays into electrical signals, said spatial structure having characteristics enabling a predetermined amount of coherence to be established between said two bundles of light rays,

the improvement comprising the steps of worsening said characteristics by a prearranged measure so as to largely frustrate recognition of the function of said one authenticating feature by intensity measurements of the scattered light, while still allowing recognition thereof by determining a sufficient degree of coherence between said two bundles of light rays,

determining the degree of coherence between said two bundles of light rays,

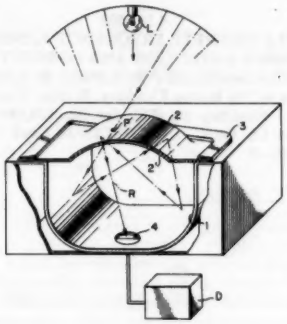
forming "yes" or "no" outputs in dependence of the degree of coherence determined, and

ascertaining from said outputs information pertaining to the genuineness of said security blank.

4,537,505
METHOD FOR DETECTING PIN HOLES AND THE LIKE IN SHEET MATERIAL FOR PACKAGING AND SIMILAR APPLICATIONS

Robert Bishop, Brookline, and Krikor Bezjian, Cambridge, both of Mass., assignors to Beltronics Inc., Brookline, Mass.

Filed Aug. 11, 1982, Ser. No. 407,097
Int. Cl.[3] G01N *21/89*
U.S. Cl. 356—237 5 Claims

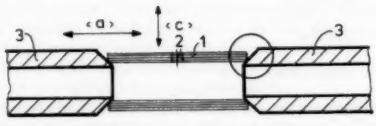


1. A method of pin-hole detection in a sheet to be used as part of a sealed enclosure, that comprises, placing the sheet over an open-mouth light-reflecting or light-scattering walled cavity; light-sealing the periphery of the sheet over the cavity mouth; brightly illuminating the outer surface of the sheet to cause light to leak through any pin hole therein into the cavity; shaping the light-reflecting cavity walls to insure multiple and randomly distributed light reflections including from the inner surface of the sheet within the cavity as light enters the pinhole; and detecting a signal from such multiply reflected light at a predetermined region within the cavity which statistically will receive at least part of such multiply reflected light to register the presence of the pin hole.

4,537,506
ATOMIZER FOR ATOMIC ABSORPTION SPECTROSCOPY

Bernhard Lersmacher, Schlossweiherstrasse 31, 5100 Aachen, Fed. Rep. of Germany; Michael P. Wassall, 32 Greenfields, Earith, Cambridge, and Philip J. Connor, 5 Mereton Walk, Hardwick, Cambridge, both of England

Filed Oct. 12, 1982, Ser. No. 433,760
Claims priority, application Fed. Rep. of Germany, Oct. 12, 1981, 3140458
Int. Cl.[3] G01N *21/16*; G01J *3/30*
U.S. Cl. 356—312 10 Claims



1. An atomizer for producing free atoms and an atomic cloud for atomic absorption spectroscopy comprising

a tubular cuvette for receiving a sample, said cuvette being at least outwardly enveloped by layers of pyrolytic graphite,

electrical supply means for Joule heating said cuvette to produce free atoms of said sample,

contact member means for contacting said cuvette and said electrical supply means, wherein said cuvette and said

contact member means are constructed to obtain a predetermined temperature distribution in said cuvette,

first contact surfaces of said cuvette and second contact surfaces of said contact member means being constructed so that electric current flows from said electrical supply means through an inner wall of said cuvette by way of said contact member means, and

interruptions of said pyrolytic graphite layers between said first contact surfaces and outer surfaces of said cuvette.

4,537,507

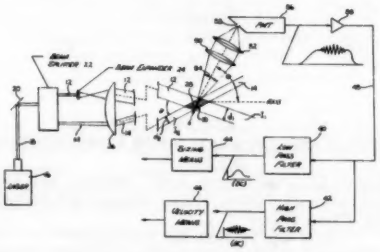
DUAL BEAM MAXIMUM INTENSITY LASER SIZING SYSTEM

Cecil Hess, Irvine, Calif., assignor to Spectron Development Laboratories, Inc., Costa Mesa, Calif.

Filed Oct. 18, 1982, Ser. No. 434,905

Int. Cl.³ G01N *15/02*

U.S. Cl. 356—336 **22 Claims**



1. In an apparatus for measuring or sensing parameters associated with particles, droplets or the like, employing laser scattering, a method for determining when a particle, droplet or the like has crossed the central portion of a first laser beam, comprising the steps of:

(a) generating a second laser beam, said second laser beam having a smaller diameter than said first laser beam;

(b) directing said laser beams along an axis and causing said beams to cross said axis at a known angle in order to establish an interference pattern within the area defined by the intersection of said first and second laser beams;

(c) sensing the scattered signal of said beams caused by a particle, droplet or the like passing through said interference pattern;

(d) filtering said signal such that only signal components having frequencies within a predetermined range are permitted to pass;

(e) detecting the presence of Doppler fringes in said filtered signal, thereby indicating that said particle, droplet or the like has crossed the central portion of said first laser beam.

4,537,508

INTERFEROMETER SPECTROMETER HAVING IMPROVED SCANNING REFERENCE POINT

Walter M. Doyle, Laguna Beach, Calif., assignor to Laser Precision Corporation, Utica, N.Y.

Filed Mar. 1, 1983, Ser. No. 470,937

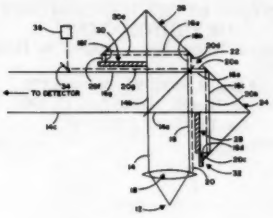
Int. Cl.³ G01B *9/02*

U.S. Cl. 356—346 **20 Claims**

1. In a spectrometer having means for receiving and integrating successive analytical interferograms provided by an analytical beam, which analytical interferograms are synchronized by reference interferograms provided by a reference beam, an interferometer, of the type having a fixed-length arm and a variable-length arm which is varied to cause spectral scanning, comprising:

a moving retroreflector in the variable-length arm which reflects both the analytical beam and the reference beam;

stationary reflecting means in the variable-length arm providing a flat folding reflector which causes the path of at least the reference beam from the retroreflector to be folded on itself, and returned to the retroreflector; and



stationary reflecting means for the reference beam in the fixed-length arm so located as to offset the reference interferogram with respect to the analytical interferogram.

4,537,509

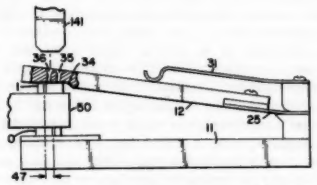
OPTICAL INSPECTION AND ALIGNMENT VERIFICATION SYSTEM

Leonard E. Kronfeld, Minneapolis, Minn., assignor to Nortronics Company, Inc., Minneapolis, Minn.

Filed Mar. 10, 1982, Ser. No. 356,328

Int. Cl.³ G01B *11/00*

U.S. Cl. 356—399 **14 Claims**



1. Apparatus for optical verification of head alignment for floppy disk transducer assemblies, comprising:

an optical probe having spaced parallel transparent viewing surfaces on opposite sides thereof and having a thickness between said surfaces small enough to permit insertion of the probe between opposing heads of a transducer assembly, said probe including image transmission and reflection means for transmitting images of transducer heads objects adjacent said viewing surfaces through the probe to end portions thereof;

optical path means positioned to receive said images transmitted from end portions of said probe, and operative to provide magnified images of the transducer heads objects adjacent said viewing surfaces for visual inspection thereof;

means for supporting a transducer assembly to be inspected with the heads thereof adjacent said viewing surfaces of said probe;

means for providing relative movement between said optical probe and said transducer assembly supporting means;

means for measurement of the relative positions of the read/write gaps of transducer heads positioned adjacent opposite sides of said probe by measuring the amount of relative movement of said probe and transducer assembly supporting means required to bring said gaps into predetermined alignment in said optical path means; and

an optical tracking scope and means positioning it in alignment with said transducer supporting means for observation and measurement of movement of the transducer

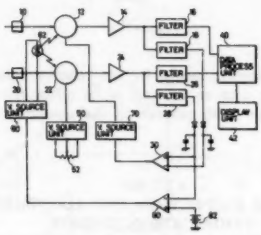
heads caused by opening of the transducer assembly to receive the optical probe.

4,537,510

OUTPUT CONTROL DEVICE FOR LIGHT DETECTORS FOR PHOTOMETERS

Kenichiro Takahasi, Naka, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 9, 1982, Ser. No. 448,271
Claims priority, application Japan, Dec. 15, 1981, 56-203249
Int. Cl.³ G01J *1/16, 1/18*
U.S. Cl. 356—435 **14 Claims**



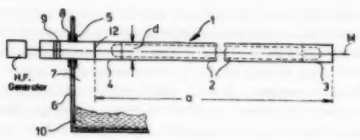
4. A device for correcting outputs from light detector adapted to detect the light passing through an object sample, a second light detectors for photometers, comprising a first light detector adapted to detect the light passing through a reference sample, a reference light source adapted to apply modulated light having a predetermined frequency to said first and second light detectors, a first filter circuit adapted to detect such a component of an output signal from said first light detector that is representative of the modulated light from said reference light source, a second filter circuit adapted to detect such a component of an output signal from said second light detector that is representative of the modulated light from said reference light source, a correcting and computing means adapted to compare output signals from said first and second filter circuits and to correct the relative sensitivities of said first and second light detectors in accordance with the results of the comparison, and a means for comparing a voltage of an output signal of one of said first and second filter circuits with a predetermined reference voltage to control the illuminance of said reference light source in accordance with the result of the comparison.

4,537,511

APPARATUS FOR GENERATING AND RADIATING ULTRASONIC ENERGY

Karl Frei, Bronschhofen, Switzerland, assignor to Telsonic AG Fur Elektronische Entwicklung Und Fabrikation, Bronschhofen, Switzerland

Continuation of Ser. No. 361,917, Mar. 15, 1982, abandoned. This application Mar. 28, 1984, Ser. No. 594,229
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1980, 3027533
Int. Cl.³ B01F *11/02;* **B08B** *3/12;* **H01L** *41/04*
U.S. Cl. 366—127 **9 Claims**



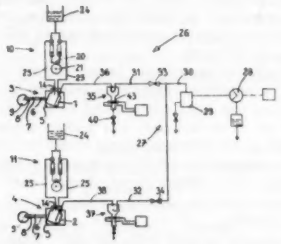
1. A device for the generation and radiation of ultrasonic energy in a liquid comprising: a first resonator having a longitudinal axis and dimensioned to be resonant in a direction along its longitudinal axis, said first resonator having a radial output surface which undergoes longitudinal vibratory displacement as said first resonator is vibrated, and a second resonator comprising a hollow tube including walls in contact with the liquid, means coupling said second resonator to said radial output surface of said first resonator, substantially at an anti-nodal region of axial vibratory motion of said first resonator, for producing longitudinal vibratory motion in said second resonator from said first resonator, said second resonator being dimensioned for producing standing longitudinal waves having a pattern of standing nodes along the second resonator and for converting said longitudinal motion into a standing radial wave motion in said second resonator which is 90° out of phase with the longitudinal wave motion.

4,537,512

METHOD AND APPARATUS FOR KORSAKOVIAN DILUTION

Jean Boiron; Christian Boiron; Jacky Abécassis, and André-Marcel Favier, all of Rhone, France, assignors to Laboratoires Boiron, Rhone, France

Filed Sep. 14, 1983, Ser. No. 532,174
Claims priority, application France, Nov. 18, 1982, 82 19618
Int. Cl.³ B01F *11/00*
U.S. Cl. 366—132 **15 Claims**



1. A Korsakovian dilution apparatus for processing at least one bottle by impregnating the inner wall of said at least one bottle with a tincture and repeatedly filling said at least one bottle with a predetermined amount of fluid, agitating said at least one bottle to dissolve a portion of said tincture into said fluid to produce a solution, and emptying said solution from said bottle for a predetermined number of cycles, said Korsakovian dilution apparatus comprising:

bottle clamping means for securing said at least one bottle;

fluid supply means for selectively supplying said at least one bottle with said predetermined amount of fluid;

shaking means selectively imparting a shaking motion to said bottle clamping means such that a portion of said tincture dissolves in said fluid to produce said solution;

solution intake means selectively operable to draw said solution from said at least one bottle;

automatic control means sequentially controlling said fluid supply means, said shaking means, and said intake means to repeatedly produce said solution from said predetermined amount of said fluid; and

automatic counting means counting the number of cycles of operation controlled by said automatic control means.

4,537,513

PROCESS FOR DISSOLVING POLYMERIC MATERIAL

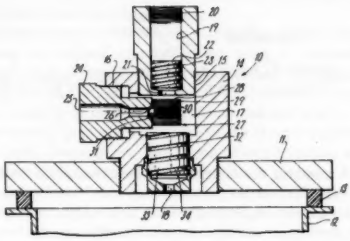
Peter Flesher, and John G. Langley, both of West Yorkshire, England, assignors to Allied Colloids Limited, United Kingdom

Filed Aug. 2, 1983, Ser. No. 519,601

Claims priority, application United Kingdom, Aug. 6, 1982, 8222726; Nov. 9, 1982, 8231898; May 13, 1983, 8313165

Int. Cl.³ B01F 5/00

U.S. Cl. 366—162 12 Claims



1. A process of dissolving into water the polymer particles of a dispersion of the particles in a non-aqueous liquid using an orifice mixer, the process comprising forcing the dispersion and the water into the orifice mixer and thereby bringing the dispersion and the water into contact under high shear, and ejecting the resultant mixture from the orifice within a period of less than about 100 milliseconds from the time of contact and in which the pressure drop between the pressure where the dispersion and the water come into contact and the constant pressure of the mixture after said ejection is at least 6 kg/cm².

4,537,514

MULTI-FUNCTION ANALOG DISPLAY STOPWATCH

Tatsuo Moriya, 3-5, Owa 3-chome, Suwa-shi, Nagano-ken, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Jun. 6, 1983, Ser. No. 501,343

Claims priority, application Japan, Jun. 7, 1982, 57-97292; Jul. 22, 1982, 57-127908; Dec. 17, 1982, 57-221574

Int. Cl.³ G04F 8/00

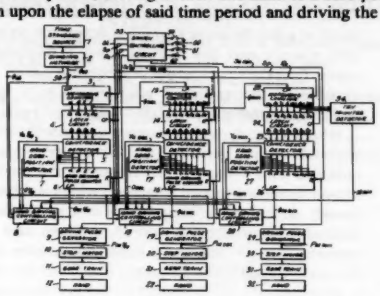
U.S. Cl. 368—107 9 Claims

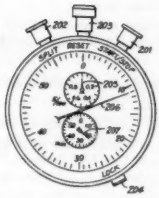
1. An analog display stopwatch for displaying elapsed time in selected time units by means of at least one hand driven by an electrical step motor, said stopwatch comprising: oscillator means for generating a high frequency signal, divider means for reducing said high frequency standard standard signal to lower frequency timekeeping signals and driver means for driving said motor on command on response to said lower frequency signals for indicating elapsed time in a selected time unit, said driver means including:

switch control circuit means for generating a signal respectively for commanding a start and a stop for time measurement and a signal for commanding a return-to-zero of each hand;

detector means for detecting the elapse of a preselected time period, said time period being measured from initiation of time measurement; and

hand driving control circuit means for permitting continuous driving of each hand during time measurement within said time period, driving at least one hand to a zero position upon the elapse of said time period and driving the at





least one hand to display the elapsed time upon generation of the stop signal after the time period.

4,537,515

RESONATOR TEMPERATURE COMPENSATED TIME BASE AND WATCH USING SAID TIME BASE

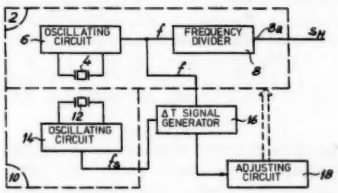
Rudolf Dinger, St-Aubin; Jean-Georges Michel, Neuchâtel, and Claude-Eric Leuenberger, Chézard, all of Switzerland, assignors to Asulab S.A., Bienne, Switzerland

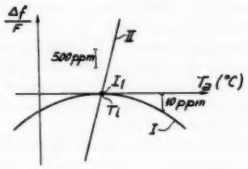
Filed Dec. 6, 1982, Ser. No. 447,457

Claims priority, application Switzerland, Dec. 17, 1981, 8060/81

Int. Cl.³ G04B 17/20

U.S. Cl. 368—202 6 Claims





1. A time base provided with thermal compensation, comprising:

a first frequency generator including a first oscillator provided with a piezoelectric resonator and producing a first signal at a first frequency which is dependent on temperature wherein said first resonator has a relationship between the relative variation in frequency ($\Delta f/f$) and the variation in temperature T with respect to its inversion temperature of the form $(\Delta f/f)=\alpha_O T+\beta_O T^2+\gamma_O T^3+\ldots$, wherein α_O, β_O and γ_O are constant coefficients;

a second frequency generator including a second oscillator provided with a piezoelectric resonator and producing a second signal at a second frequency which is substantially linearly dependent on temperature in a range for which thermal compensation is desired, wherein said second resonator has a substantially linear relationship between the relative variation in frequency ($\Delta f/f$) and the variation in temperature T with respect to the inversion temperature of the first resonator, of the form: $(\Delta f/f)=\alpha_z T+\beta_z T^2$, α_z and β_z being coefficients such that α_z is at least one hundred times greater than β_z, wherein β_z is of the same order of magnitude as β_o;

means for producing a signal which is representative of temperature, in response to the signals produced by said oscillators;

means for producing a correction signal in response to said temperature signal, and

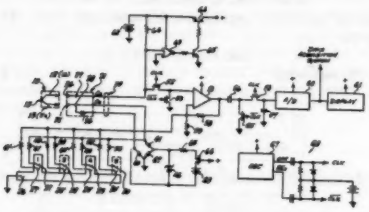
means for adjusting the frequency of the signal produced by said first frequency generator in response to said correction signal.

4,537,516

ELECTRONIC THERMOMETER

Saul Epstein, 14558 Deervale Pl., Sherman Oaks, Calif. 91403

Filed Sep. 27, 1982, Ser. No. 424,601
Int. Cl.³ G01K *7/14, 15/00*
U.S. Cl. 374—1 **39 Claims**



21. In an electronic thermometer of the type comprising a replaceable thermocouple probe and signal conditioning means, the improvement which comprises means responsive to impedance connected across the input of said signal conditioning means for energizing said signal conditioning means when a thermocouple probe is connected to said input, and for deenergizing said signal conditioning means when said thermocouple probe is disconnected.

36. In a measuring system for measuring the magnitude of a physical variable, said system having replaceable sensors and signal conditioning means, the improvement which comprises:

(a) a group of replaceable sensors selected to have substantially identical transfer functions; and

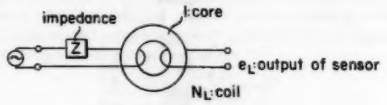
(b) replaceable calibration adjusting means having a characteristic depending on said transfer function for use in conjunction with any one of said replaceable sensors to adjust the calibration of said signal conditioning means responsive to said characteristic.

4,537,517

TEMPERATURE SENSITIVE AMORPHOUS MAGNETIC ALLOY

Koichiro Inomata, Yokohama, and Shinichi Murata, Tokyo, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Division of Ser. No. 346,952, Feb. 8, 1982, abandoned. This application Oct. 18, 1983, Ser. No. 543,053
Claims priority, application Japan, Feb. 10, 1981, 56-17431
Int. Cl.³ G01K *7/38;* H01H *37/32*
U.S. Cl. 374—21 **8 Claims**



1. A method for detecting a predetermined temperature, comprising the steps of:

(a) by electromagnetically exciting a magnetic core element, inducing a voltage in electrically conductive means, which core element is comprised of a temperature sensitive amorphous magnetic alloy having a Curie point at approximately said predetermined temperature, which Curie point is not higher than 200° C., said alloy consisting essentially of a composition represented by the formula

$$(M_{1-a-b}Ni_aCr_b)_{100-z}X_z$$

wherein M represents a cobalt atom or an iron atom; X represents at least one of a phorophorous atom, a boron atom, a carbon atom and a silicon atom; a is a numeral ranging between 0.2 and 0.8 inclusive when M is Co, or a is a numeral ranging between 0.4 and 0.9 inclusive when M is Fe; b is a numeral ranging between 0 and 0.05, such that the sum of a and b does not exceed 0.8 when M is cobalt or 0.9 when M is iron; and z is a numeral ranging between 15 and 30 inclusive, and

wherein a and z are selected such that the temperature difference between the temperature showing the maximum value of effective permeability at 10 kHz and the temperature of the Curie point is less than 10 centigrade degrees;

(b) heating said core to a temperature above said predetermined temperature; and then

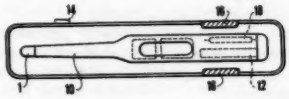
(c) measuring an abrupt decrease in said voltage.

4,537,518

ELECTRONIC CLINICAL THERMOMETER

Masakazu Murase, Fuji, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 418,287, Sep. 15, 1982, Pat. No. 4,461,584. This application Mar. 23, 1984, Ser. No. 592,704
Claims priority, application Japan, Dec. 28, 1981, 56-214320
The portion of the term of this patent subsequent to Jul. 24, 2001, has been disclaimed.
Int. Cl.³ G01K *7/00*
U.S. Cl. 374—188 **6 Claims**



1. An electronic clinical thermometer which comprises;

temperature sensing means for producing an output signal commensurate with temperature;

decision means for discriminating, on the basis of the output signal of said temperature sensing means, a temperature above a predetermined threshold temperature as well as a rising temperature gardient over a predetermined period of time, said decision means first discriminating a temperature above the threshold temperature and then discriminating a rising temperature gradient from said discriminated temperature; and

measuring means placed in a measurement start mode by a discrimination from said decision means for initiating a temperature measurement on the basis of an input from said temperature sensing means;

said decision means comprising a counting means for producing an output commensurate with a temperature sensed by said temperature sensing means; first discriminating means for making a first discimination in response to an input from said counting means indicative of a count corresponding to a temperature above the predetermined threshold temperature, and second discriminating means for producing a second discrimination in response to subsequent output from said counting means indicative of a count over said predetermined period of time corresponding to a rising temperature gradient of a magnitude larger than that of a predetermined rising temperature gradient, said second discrimination establishing the measurement start mode.

4,537,519

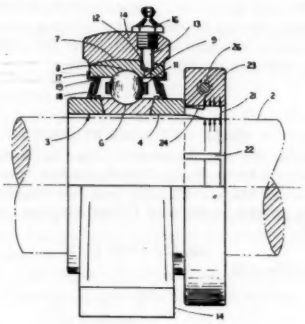
SHAFT LOCKING DEVICE FOR BEARING ASSEMBLIES

Albert M. LaRou, Naperville, and Eldon A. Atteberry, Aurora, both of Ill., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Sep. 14, 1984, Ser. No. 650,452

Int. Cl.³ F16C *35/063*

U.S. Cl. 384—478 **9 Claims**



1. A bearing assembly comprising: inner and outer annular bearing rings, each including bearing raceways positioned in opposed annular spaced relation to each other; a rolling element loaded annular cage mounted in the space between said opposed raceways with the rolling elements therein engaging in said opposed raceways; said inner bearing ring including slotted inner ring finger extensions extending in cantilever fashion from at least one end thereof; and force means to compress said inner ring finger extensions when said inner ring finger extensions are mounted on a shaft to lock said inner ring tightly to said shaft; said inner ring finger extensions having a recessed annular grooved area extending at least partially therearound in spaced relation from the outer ends of said finger extensions of sufficient breadth and depth to convert what would otherwise be shearing stresses along such area to bending stresses and thus improve radial and thrust accommodation capacity and rotational torque transmission.

4,537,520

DOT PRINTER HEAD WITH REDUCED MAGNETIC INTERFERENCE

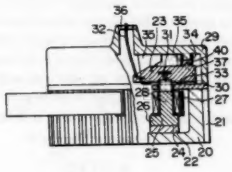
Kuniaki Ochiai, and Shigeo Komakine, both of Shizuoka, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Nov. 15, 1983, Ser. No. 552,066

Claims priority, application Japan, Nov. 16, 1982, 57-201430; Dec. 20, 1982, 57-223405; Jan. 31, 1983, 58-14219

Int. Cl.³ B41J *3/12*

U.S. Cl. 400—124 **7 Claims**



1. A dot printer head comprising an annular plurality of armatures each mounted for motion to actuate a needle, a spring for urging each of said armatures in a printing direction, a permanent magnet on which cores holding faces are formed in a plane perpendicular to a line connecting said cores and said plurality of armatures, a yoke providing a magnetic path between said permanent magnet and said armatures, and an annular plurality of cores each having a mounting portion contacted with one said core holding face of said permanent magnet, each of said cores further having a post-like projection which extends from said mounting portion and has an electromagnetic coil held thereon, the area of each said mounting portion which is contacted with said core holding face being greater than the area of the cross section of said post-like projection, said cores being secured to said permanent magnet in spaced relationship from each other in an annular row on said core holding faces of said permanent magnet, said area of said mounting portion defining a trapezoid having sides defined by radii of said annular row so that said area of said mounting portion is maximized.

4,537,521

PAPER FEED MECHANISM WITH VARYING CONTACT PRESSURE

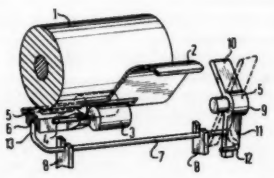
Rudolf Rekewitz, Wolfratshausen, and Hermann Wambach, Unterhaching, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 26, 1983, Ser. No. 545,812

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1982, 3240989

Int. Cl.³ B41J *11/26*

U.S. Cl. 400—637.6 **7 Claims**



1. A paper feed mechanism for printing and typing equipment, comprising:

(a) a frame;

(b) a platen;

(c) at least one paper pressure roller support shaft having

first and second ends: a first end of said shaft being mounted in said frame;

(d) at least one paper pressure roller mounted on said shaft; and

(e) means to vary the force applied by said roller against said platen, said means comprising a frame-supported spring wire lever having first and second arms, the second end of said shaft being supported by said first arm of said spring wire lever, said second arm being pivotally supported and settable at a plurality of predeterminable pivot positions, said spring wire lever being movable to and from an additional predetermined position to move said roller away from and toward said platen whereby both the position of said roller with respect to said platen and the force applied by said roller against said platen may be selectively varied by setting the position of said second arm so that the holding pressure of paper which may be insertable between said platen and said roller is selectively variable.

4,537,522

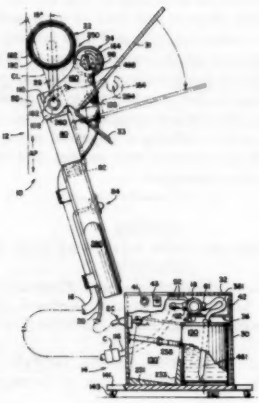
PAINT DISPENSING APPLICATOR WITH SAFETY FEATURES

Joseph C. Charney; Phillip M. Goodman, and Robert H. Morgan, all of Milwaukee, Wis., assignors to EPR Corporation, Danville, Calif.

Continuation-in-part of Ser. No. 344,545, Feb. 1, 1982, Pat. No. 4,422,789, and a continuation-in-part of Ser. No. 193,001, Oct. 2, 1980, abandoned. This application Jul. 1, 1983, Ser. No. 509,687

Int. Cl.³ B43M *11/02*

U.S. Cl. 401—218 **24 Claims**



1. A paint applying apparatus comprising:

a frame;

an applicator roller mounted on said frame for applying paint to a surface;

a paint feed roller removably mounted on a pivotable carriage on said frame;

bias means normally holding the feed roller in engagement with said applicator roller;

said feed roller having dispensing means therewith for thoroughly and efficiently distributing paint thereacross;

a portable base unit;

power means with said base unit for supplying paint under relatively low pressure to said feed roller through a flexible connecting hose;

a handle removably attached to said frame having a switch thereon for remotely controlling energization of said power means for supplying paint; and

said dispensing means on said feed roller for thoroughly and efficiently distributing paint thereacross including a pair of closed loop helical troughs extending the working width of said feed roller.

4,537,523

DEVICE FOR DETECTING THE POSITION OF A SHAFT IN A COUPLING ELEMENT, AND IN PARTICULAR A UNIVERSAL JOINT YOKE

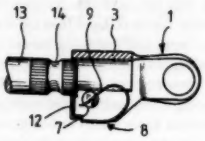
Bernard Haldric, Vendome, France, assignor to NACAM, Vendome, France

Filed Jun. 6, 1984, Ser. No. 617,638

Claims priority, application France, Jun. 13, 1983, 83 09757

Int. Cl.³ F16B *41/00*

U.S. Cl. 403—12 **11 Claims**



1. A device for detecting the position of a coupling element having a split hub and spaced apart ears of clamping means for the hub, on a shaft or other torque transmitting element, said hub defining a throughway passage for said shaft, said ears defining throughway apertures for receiving a screw for tightening the clamping means, said device comprising a resiliently yieldable element mounted on the hub and having a strip disposed between said ears and extends into said passageway and an end portion which extends across said apertures to prevent full insertion of said screw in said apertures in the absence of said shaft, said strip of the resiliently yieldable element being positioned and arranged to be urged by said shaft laterally back out of the path of the shaft upon insertion of said shaft in the hub of the coupling element so that said end portion ceases to extend across said apertures and clears the screw when the shaft has sufficiently penetrated the hub.

4,537,524

BALL AND SOCKET JOINT

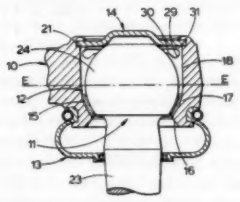
William M. Hanson, Leamington Spa, England, assignor to Automotive Products plc, Leamington Spa, England

Filed Apr. 12, 1984, Ser. No. 599,329

Claims priority, application United Kingdom, Apr. 16, 1984, 8310345

Int. Cl.³ F16C *11/06*

U.S. Cl. 403—140 **12 Claims**



1. A ball and socket joint comprising:

a ball pin having a shank and a part-spherical head;

a housing defining a substantially cup-shaped cavity including a cylindrical bore portion and an aperture, the shank of the ball pin extending through said aperture;

a bearing insert of a resilient material within said cavity and partially enclosing the part-spherical head of the ball pin and including a truncated spherical base portion, a thickened end portion which before insertion into the housing has a flared outer surface, an end face, an internal cylindri-

cal surface and slots in the thickened end portion extending axially from the end face, said thickened end portion being deformed during assembly such that the flared outer surface after assembly conforms to the cylindrical bore portion of the housing and the internal cylindrical surface conforms to the part-spherical head of the ball pin; and retainer means in the housing for retaining the bearing insert.

4,537,525

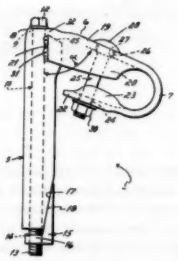
BICYCLE HANDLEBAR STEM

David K. McMurtrey, 540 S. Algonquin Dr., Mayville, Ky. 41056

Continuation of Ser. No. 492,807, May 9, 1983,. This application Jun. 4, 1984, Ser. No. 640,638

Int. Cl.[3] **F16B** *7/08*

U.S. Cl. 403—191 **10 Claims**



8. A one-piece, sheet metal bicycle handlebar mounting stem comprising,

a hollow cylindrical post section adapted to be mounted within the stem of a fork of a bicycle,

a neck section integral with and extending from the top of said post section, said neck section having a top portion and a pair of side flanges, said top portion defining an angle with said post section, one edge of each of said pair of said flanges extending generally parallel to the axis of said cylindrical post section, said one edge of each of said pair of side flanges being welded to the periphery of said post section, and

a handlebar receiving head section of substantially cylindrical shape formed integral with said neck section.

4,537,526

HUB MOUNTING DEVICE

Werner Hartl, Plainsboro, N.J., assignor to Roller Bearing Company of America, West Trenton, N.J.

Filed Nov. 16, 1984, Ser. No. 672,236

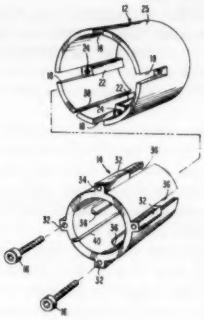
Int. Cl.[3] **F16B** *2/14*

U.S. Cl. 403—370 **11 Claims**

9. A radially expandable device for mounting a hub upon a shaft, comprising:

(a) outer and inner wedges bearing against the hub and shaft respectively and having slidably contacting, tapered surfaces, each wedge having circumferentially spaced slots and having ribs aligned with the slots, the ribs of one wedge extending within the slots of the other wedge in alignment with the ribs of said other wedge; and

(b) fastening elements extending through the aligned ribs for relatively axially shifting the wedges in a direction to



radially expand the same into gripping engagement with the hub and shaft.

4,537,527

MEANS FOR PROVIDING A VERTICAL DRAIN IN SOIL

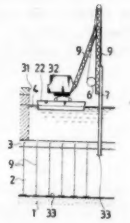
Mauno O. Juhola, Helsinki, and Matti Numminen, Espoo, both of Finland, assignors to Pohjavahvistus Oy, Helsinki, Finland

Filed May 28, 1982, Ser. No. 383,167

Claims priority, application Finland, Mar. 19, 1982, 820951

Int. Cl.[3] **E02B** *11/00;* **E02D** *3/10*

U.S. Cl. 405—50 **5 Claims**



1. Apparatus for making a vertical drain in soil, comprising a push tube to be pushed into and pulled up from the soil and which carries within it a prefabricated drain having an anchor on a lower end thereof which aids in keeping the prefabricated drain stationary when the push tube is being pulled upwards, a cutting-off means carried within said push tube at a lower end thereof for cutting the prefabricated drain at a desired height which is within said tube, pushing means provided within said push tube above the cutting-off means for pushing a leading uncut end of the prefabricated drain within said tube to a point that is below the bottom end of the tube, said pushing means comprising pressing means mounted on both sides of the prefabricated drain and arranged to press against the prefabricated drain from opposite sides, and operating means for actuating said pressing means to press the prefabricated drain therebetween and move said pressing means and prefabricated drain downward together a desired length in said push tube so that said leading uncut end protrudes below the bottom end of the tube, whereby another anchor can be affixed to the lower uncut end of the prefabricated drain protruding from the push tube for use with a new drain section after the push tube is pulled up.

4,537,528

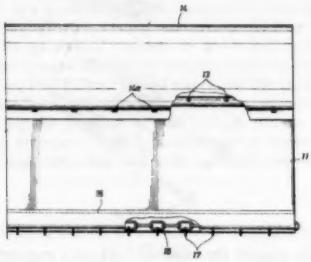
FIREPROOF BOOM

Wayne F. Simpson, Anchorage, Ak., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 520,873, Aug. 5, 1983, abandoned. This application Nov. 27, 1984, Ser. No. 675,456

Int. Cl.³ E02B *15/04*

U.S. Cl. 405—72 **6 Claims**



1. A fireproof boom for containing a flammable pollutant on a water surface comprising, a flotation member, and at least two layers of heat-resistant, water-sorbent material surrounding the flotation member and extending into the water and functionable to perform an osmotic wicking action to draw water up into the layers of the heat-resistant material and around the flotation member, thereby positioning the water to from protective steam about the flotation member upon exposure of the boom to fire.

4,537,529

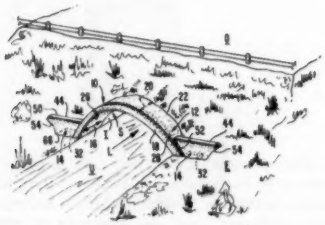
EARTH RETAINING END ELEMENT FOR USE WITH OVERFILLED LOAD SUPPORT STRUCTURES

Louis N. FitzSimons, 10149 Cedar La., Kensington, Md. 20895

Filed Mar. 19, 1984, Ser. No. 590,799

Int. Cl.³ E01F *5/00*; E04B *1/32*; E21D *11/00*

U.S. Cl. 405—125 **9 Claims**



1. An earth retaining end element for retaining earth overfill adjacent to an overfilled load support structure, with the load support structure including an arch element extending upward from foundation level, comprising:

(A) a longitudinal extension means having a crown and extending longitudinally from the arch element out of the earth overfill so that the earth overfill forms a toe on top of said longitudinal extension means, with said toe being unrestrained in at least one horizontal direction for permitting essentially unrestrained support of earth overfill on top of the; longitudiinal extension means and

(B) a retaining panel means having a height less than the height of the extension means crown above the foundation level and being located adjacent to said longitudinal extension means, said retaining panel means being spaced longitudinally from the arch element to contact the earth overfill at locations spaced from the arch element and resisting horizontal earth pressure at locations spaced from the top of the arch element for resisting horizontal movement of the earth overfill located adjacent to the arch element, whereby the earth overfill is supported without using a spandrel wall or wingwalls.

4,537,530

MARINE CABLE BURYING METHOD AND DEVICE THEREFOR

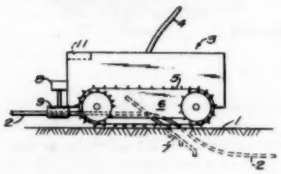
Kazuomi Yamamura, Yokohama; Hideo Ishihara, Kamakura; Yoshinao Iwamoto, Fujimi; Hifumi Sakaguchi, Abiko; Masao Morita, and Toshio Izawa, both of Tokyo, all of Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 250,882, Apr. 3, 1981, abandoned. This application Mar. 7, 1984, Ser. No. 585,631

Claims priority, application Japan, Apr. 3, 1980, 55-42758

Int. Cl.³ F16L *1/04*

U.S. Cl. 405—160 **1 Claim**



1. A marine cable burying device comprising:

a vehicle adapted for movement along a marine bed;

ultrasonic signal-receiving means carried by said vehicle for receiving transmissions from ultrasonic oscillators previously positioned along the cable, said signal-receiving means being rotatable and directed for scanning in a horizontal plane;

means for rotating said signal-receiving means, including a potentiometer rotatable therewith;

means coupled to said receiving means for guiding said vehicle towards the cable in response to said transmissions by comparing the detected output from said ultrasonic signal-receiving means with the potentiometer reading obtained by rotational scanning;

means carried by said vehicle for excavating a trench in the marine bed;

means extending forward of said vehicle and having arms for engaging the cable, each arm terminating in a semicylindrical engagement device, the arms being spring loaded for forcing apart said engagement devices allowing any one of said engagement devices to contact the cable upon approach of the burying device to the cable; and

means responsive to movements of said arms for directing said vehicle along the cable to provide for the excavation of a trench at the location of the cable, said directing means including a set of sensors coupled to respective ones of said arms for sensing a displacement of one of said arms in response to contact of the engagement device of said one arm with the cable, said engaging means lowering the cable into the trench for burial.

4,537,531

TILE LAYER

David L. Diefenthaler, 80 West La., Apt. 2-H, Columbus, Ohio 43201

Filed Jun. 14, 1982, Ser. No. 387,814

Int. Cl.³ F16L *1/02*

U.S. Cl. 405—174 **4 Claims**

1. An apparatus for laying semi-flexible arched plastic drainage tile having a flexible flat bottom in a trench, comprising:

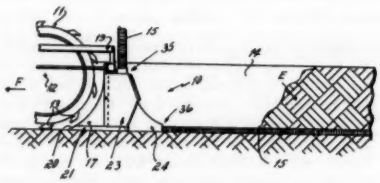
two spaced side shields, the side shields being rigidly inter-

connected by bracing means, the side shields defining a layer interior which is rearwardly and upwardly open, an upper tile entry end and a lower tile discharge end,

a top panel means substantially enclosing the rearwardly and upwardly open interior of the layer when mounted on the side shields,

plural guide rollers mounted within the interior of the layer for directing the tile in a smooth curved path between the side shields from the entry end to the discharge end for laying in the trench, a plurality of guide rollers being removably mounted on the side shields and a plurality of guide rollers being mounted on the top panel means,

means for mounting the top panel on the side shields so it can be opened to provide access to the interior of the layer for loading and unloading of tile through the upwardly open interior,



the arched tile being fed into the entry end in a collapsed form, the flat bottom of the arched tile lying within the apex of the curved upper portion of the tile, the guide means further including a spreader means for opening the collapsed arched tile, the spreader means comprising a concave roller, and a spreader roller, the spreader roller having a radially extending disc-shaped central portion and tapered ends, the spreader roller and the concave roller being in opposed spaced relation such that when arched tile is caused to pass therebetween, the concave roller applies a force on the tile substantially perpendicular to the apex of the curved portion of the tile and the arched tile is partially spread out in opposite directions across the spreader roller.

4,537,532

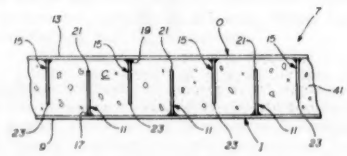
COMPOSITE LOAD BEARING OUTER SKIN FOR AN ARCTIC STRUCTURE AND A METHOD FOR ERECTING SAME

Jade Chen, Humble; Jal N. Birdy, and Brian J. Watt, both of Kingwood, all of Tex., assignors to Brian Watt Associates, Inc., Houston, Tex.

Filed Dec. 20, 1983, Ser. No. 563,940

Int. Cl.[3] **E02D** *23/00, 31/00;* **E04B** *5/04*

U.S. Cl. 405—217 **11 Claims**



1. A load bearing outer skin for an arctic offshore structure comprising:

an inner assembly;

an outer assembly aligned substantially parallel to said inner assembly and defining an internal cavity therebetween;

said inner and outer assemblies each comprising:

a skin plate member;

a plurality of stiffeners attached at spaced intervals to said skin plate member and mounted substantially perpendicular to said skin plate member so as to extend partially into the internal cavity;

whereupon said stiffeners of said inner assembly are out of contact with said skin plate member of said outer assembly and said stiffeners of said outer assembly are out of contact with said skin plate member of said inner assembly; and

a cementitious material substantially filling the internal cavity;

whereupon shear forces exerted on said skin plate member of said outer assembly are transferred to said inner skin plate member through the bond between said cementitious material and said skin plate members; and also via said stiffeners connected to said outer skin plate member whereupon said shear forces are then transmitted to said stiffeners on said inner skin plate member through said cementitious material and then to said inner skin plate member, thereby allowing said inner and outer assembly and said cementitious material to form a composite flexural member in resisting applied loads.

4,537,533

INSTALLATION AND LEVELLING OF SUBSEA TEMPLATES

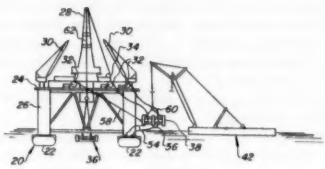
James E. Hampton, Peterculter, Scotland, assignor to Sedco, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 292,014, Aug. 11, 1981, Pat. No. 4,435,108. This application Dec. 21, 1982, Ser. No. 450,992

Claims priority, application United Kingdom, Jan. 28, 1981, 8102548; Jan. 28, 1982, 8202491

Int. Cl.[3] **E02B** *17/02*

U.S. Cl. 405—227 **11 Claims**



1. A method of positioning a template or the like on the seabed comprising the steps of:

providing a floating vessel having a hoisting apparatus including a motion compensator suspended from said hoisting apparatus, and suspension means adapted to be connected to said motion compensator and to said template for lifting said template in response to operation of said hoisting apparatus;

providing means fixed to the seabed and adapted to be connected to said template for securing said template in a predetermined level position on the seabed;

providing adjustable tension means adapted to interconnect said suspension means and said means fixed to the seabed;

connecting said suspension means to said hoisting apparatus and said template;

interconnecting said tension means with said suspension means between said motion compensator and said template and with said means fixed to the seabed;

operating said hoisting apparatus to lift said template to level said template in a predetermined position while allowing said motion compensator to compensate for movement of said vessel with respect to said seabed,

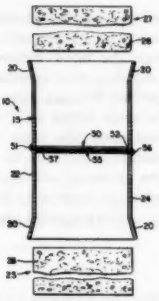
adjusting the tension in said tension means to dampen motion between said template and said means fixed to the seabed; and

securing said template to said means fixed to said seabed.

4,537,534
DRIVE FIT COUPLING FOR PRECAST CONCRETE PILES

Richard O. Marsh, Jr., 401 Standard Life Bldg., Pittsburgh, Pa. 15222

Filed Jun. 27, 1983, Ser. No. 507,765
Int. Cl.³ E02D *5/00, 5/72*
U.S. Cl. 405—252 **2 Claims**



1. A drive fit coupling for joining a pair of plain end precast piles each having a polygonal cross sectional configuration comprising:

(a) an expandable sleeve having entry portions at each end thereof sized to receive the piles and align the sleeve and piles for engagement therebetween, said sleeve otherwise having a cross sectional configuration generally the same as that of the piles and having a portion of its perimeter extending inwardly to encroach upon the space which will ultimately be occupied by the piles in a manner so that when the piles are driven into the sleeve, said inwardly extending portions of the sleeve perimeter are forced outwardly causing the sleeve to fit tightly over the ends of the piles; and

(b) pile stopping means intermediate the ends of the coupling and comprising:

(i) a first horizontally oriented plate having one end thereof secured to one side of the sleeve and extending inwardly intermediate the ends of the sleeve; and

(ii) a second horizontally oriented plate secured at one end thereof to an opposite side of the sleeve, said second plate also extending inwardly from the vertical center of the sleeve in a manner so that the first and second plates slide over each other as the piles are driven into the sleeve thereby allowing the sleeve to freely expand while preventing either pile from entering the sleeve beyond the vertical center of the sleeve.

4,537,535
ROCK REINFORCEMENT

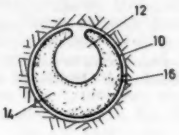
John W. MacBain, 205 Anderson Ave., Northcliff Ext. 2, Johannesburg, Transvaal, South Africa

Filed Jun. 23, 1982, Ser. No. 391,288
Claims priority, application South Africa, Jun. 25, 1981, 81/4291
Int. Cl.³ E21D *20/02*
U.S. Cl. 405—260 **20 Claims**

1. Apparatus component assembly combination for reinforcing a hole formed in rock comprising:

as first component at least one expandable tubular member having a longitudinally extending bore and adapted to be placed in a hole formed in rock, and

as second component in combination therewith a selective supply of a volume increasing settable and expandable non-explosive material which in initial unset and unexpanded condition occupies a given volume and in final set and expanded condition occupies an increased volume relative to said given given volume, and which non-explosive material is capable of changing from its unset to its set condition over a period of setting time and during its setting period is capable of increasing expanding and as it expands of increasingly generating a compressive force in the expanding direction of its increasing volume until it reaches its final set and expanded condition and occupies said increased volume,

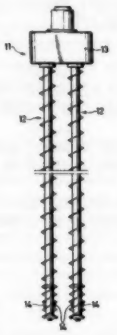


said supply of non-explosive material being disposed within the bore of the tubular member, such that when the tubular member is disposed in said hole formed in the rock, said non-explosive material upon changing from its unset to its set condition during its setting period causes the adjacent portion of the tubular member to expand outwardly into frictional contact with said hole in the rock, said supply of non-explosive material being sufficient upon setting to maintain and frictional contact but being insufficient during and upon setting to split the rock.

4,537,536
PROCESS AND APPARATUS OF CONSTRUCTING A WATER TIGHT UNDERGROUND PILE WALL

Yoshio Tsubonuma, Hoya, and Tohru Kawai, Chiba, both of Japan, assignors to The Shimizu Construction Co., Ltd., Tokyo, Japan

Filed Oct. 18, 1983, Ser. No. 543,071
Int. Cl.³ E02D *5/18*
U.S. Cl. 405—267 **7 Claims**



1. Apparatus for producing an elongated water-tight pile wall consisting of a row of mutually overlapping and mutually interpenetrating subsequently and previously formed adjacent pile wall portions such that one previously formed pile wall portion has a longitudinally extending groove therein and an adjacent subsequently formed pile wall portion has a longitudinally extending torque that is received in the groove to provide a water-tight interlock therebetween, comprising:

a drive;

a pair of longitudinally extending and generally parallel augers operative to excavate the earth for corresponding previously formed and subsequently formed pile wall portions each mounted on an end thereof for rotary motion to said drive and axially spaced by a distance less than

the opertive width dimension of an auger to insure overlapping between adjacent previously formed and subsequently formed pile wall portions, each auger having a hollow shaft;

a hollow cutting head having a tip mounted for rotation with the elongated shaft of each auger with the hollow of the head in fluid communication with the hollow of the shaft and in fluid communication with an aperture provided therefor in said tip;

first and second pairs of elongated cutting blades each having ends having an operative generally rectangular geometry of dimensions selected to be less than the operative width of an auger to cut said grooves in adjacent previously formed pile wall portions;

first means for mounting said first pair of cutting blades to one of said heads for motion between a first position where the lateral dimension defined between the ends of said first pair of cutting blades is less than the operative width dimension of its auger and a second position where the lateral dimension defined between the ends of said first pair of cutting blades is greater than the operative width dimension of its auger to allow the generally rectangular cutting blades to cut into the confronting surrface of the previously formed pile portions to form said longitudinally extending grooves to insure the mutual interpenetration of subsequently formed and previously formed adjacent pile wall portions;

second means for mounting said second pair of cutting blades to the other one of said heads for motion between a first position where the lateral dimension defined between the ends of said second pair of cutting blades is less than the operative width dimension of its auger and a second position where the lateral dimension defined between the ends of said second pair of cutting blades is greater than the lateral width dimension of its auger to allow the generally rectangular cutting blades to cut into the confronting surface of the previously formed pile wall portion to form said longitudinally extending grooves likewise to insure the mutual interpenetration of adjacent subsequently formed and previously formed adjacent pile wall portions; and

means coupled to said augers and to said first and second pairs of cutting blades for selectively moving said first and said second pairs of cutting blades to a selected one of their first and second positions.

4,537,537

METHOD OF SHAPING BY GENERATING FOR PRODUCING PROFILES ON WORKPIECES, AND APPARATUS FOR PERFORMING THIS METHOD

Friedrich Becher, and Walter Eggert, both of Ludwigsburg, Fed. Rep. of Germany, assignors to Hermann Pfauter GmbH & Co., Ludwigsburg, Fed. Rep. of Germany

Filed Aug. 6, 1982, Ser. No. 406,082

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1981, 3131381

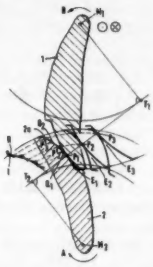
Int. Cl.³ B23F *5/16*

U.S. Cl. 409—34 **12 Claims**

1. An apparatus for shaping by generating for producing profiles on workpieces with a tool, said apparatus comprising:

a rotatably driven shaping tool which additionally carries out a stroke movement in the direction of its axis of rotation; and

a rotatably driven clamping device for said workpiece; means for the rotary motions of said tool and of said clamping device occurring continuously according to a fixed preset transmission ratio, and means for the stroke movement of said tool and the shaping movement being coupled with one another according to the equation $p=k(\pm)q$, where p is the number of small cuts per work-



piece rotation, $k=int(p+0.5)$, and q is at least approximately $1/i$, where i is the number of shaping rotations.

4,537,538

APPARATUS FOR WORKING ON TURBINE BLADE MOUNTING GROOVES

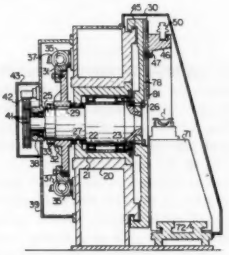
Sachio Mitamura, Kitaibaraki, and Hirotsugu Kuroume, Hitachi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 7, 1983, Ser. No. 501,992

Claims priority, application Japan, Jun. 7, 1982, 57-96216

Int. Cl.³ B23D *37/14*

U.S. Cl. 409—217 **2 Claims**



1. An apparatus for working on mounting grooves formed at a base of turbine blades of a radial entry type for mounting the turbine blades on rotor disks, the apparatus comprising:

rotary drive means;

a rotary disk driven by said rotary drive means for rotation substantially in a vertical plane;

a plurality of cutters supported on said rotary disk, said plurality of cutters being located in positions forming an arc on said rotary disk in such a manner that cutters for giving coarse finishes, cutters for giving middle finishes, and cutters for giving final fine finishes are arranged successively in the indicated order in the direction of rotation of said rotary disk, said plurality of cutters are mounted on said rotary disk through a cutter holder;

said rotary disk is formed with a plurality of T-shaped slots for guiding said cutter holder in its movement radially of the rotary disk, and a plurality of racks for positioning said cutter holder radially of said rotor disk;

blade holding means for supporting a tubine blade in such a manner that a groove of coarse finishes formed beforehand at the base of said turbine blade is located in a position through which said plurality of cutters move as said rotary disk is rotated;

wherein a rotation of said rotary disk causes said cutters to move through the groove of said turbine blade to be

machined, to give fine finishes to the mounting groove of said turbine blade; and

said cutter holder is mounted on an end face of said rotary disk, said cutters are mounted on said cutter holder such that said cutters extend radially outwardly from an outer peripheral surface of said cutter holder and are fixed so as to be maintained substantially equidistantly spaced from each other, and a distance from a center of rotation of said rotary disk to said cutters is adjustable so as to conform with a diameter of the rotor disk on which the turbine blades to be machined are to be mounted.

4,537,539

LASHING BAR

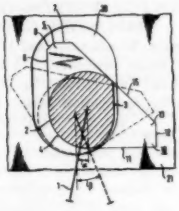
Dieter Borchardt, Rissener Dorfstr. 45, 2000 Hamburg 56, Fed. Rep. of Germany

Continuation of Ser. No. 402,532, Jul. 28, 1982, abandoned. This application Nov. 13, 1984, Ser. No. 670,672

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1981, 8123436[U]; Sep. 3, 1981, 8125939[U]

Int. Cl.³ B61D *45/00*

U.S. Cl. 410—77 **5 Claims**



1. A lashing bar for incorporation in a lashing assembly for lashing containers to the deck of a ship, where the containers each have upper and lower corners provided with means defining anchoring openings with mouths of two different respective standard perimetrical figures, each opening being enlarged to the left, to the right internally of its mouth so that a perimetrical edge is defined at the mouth to the left, to the right and upwardly of a lower lip thereof, where the standard perimetrical figure of each bottom corner end opening, each bottom corner side opening and each upper corner side opening is generally that of a vertically elongated rectangle with substantially semi-circular upper and lower ends, and where the perimetrical figure of each upper corner end opening is generally that of a square with a substantially semi-circular lower end and a slightly arched upper end, said lower ends each providing a respective said lower lip,

said lashing bar being constructed and engaged for alternative locking in said corner openings without regard to which of said two different standard perimetrical figures of mouth such corner openings have, and comprising:

a longitudinally elongated bar having a longitudinal axis and two opposite ends;

a hooking-in fitting provided on one end of said bar, this hooking-in fitting being adapted to be selectively, alternatively introduced into each of said openings and to clamp therein to the respective corner, by including:

a pin mounted on said one end of the bar, said pin having a longitudinal axis extending substantially perpendicularly to the longitudinal axis of the bar, this pin having an outer peripheral surface extending angularly about said longitudinal axis of said pin, and

a first locking lug attached to the pin so as to have a base on the pin and a free end located remotely of the pin;

said first locking lug extending from base to free end, generally longitudinally of the bar, and from the pin in a direction away from the end of said bar which is opposite to said one end;

said first locking lug having a maximum width, measured transversally of its base, which is smaller than the maximum width of the mouth of each said standard lower corner anchoring opening;

the distance between said free end of said first locking lug and whichever is the furthest therefrom of

(a) the furthest opposite side portion of said peripheral surface of said pin from where said first locking lug is based on said pin, and

(b) the furthest extent of said first locking lug from said free end thereof, being smaller than the height of the mouth of each said standard lower corner anchoring opening, but sufficiently large as to permit said first locking lug after, entering a said standard upper corner end opening to engage the respective container upper corner marginally of the respective opening mouth from within the respective end opening upon angular displacement of said bar at least generally about said longitudinal axis of said pin toward a clamping position adjacent the respective container;

said lashing bar being further characterized in having:

an additional locking lug attached to said pin so as to have a base on the pin and a free end located remotely of the pin;

said additional locking lug extending radially outwardly of the pin and being displaced angularly about said longitudinal axis of said pin from the first-described locking lug by an amount sufficient that when said bar is in said clamping position said additional locking lug engages the respective container upper corner marginally of the respective opening mouth from within the respective opening across the respective opening mouth from where said first-described locking lug is engaged;

said first locking lug and said additional locking lug comprising respective, plate-like members each having opposite faces, corresponding ones of which are substantially coplanar, and each having an edge which proceeds from the respective base to the respective free end to provide respective outer edge portions disposed relatively distally of one another, and around the respective free end and back to the respective base to provide respective inner edge portions disposed relatively proximally of one another;

the two said outer edge portions, respectively of said first locking lug and said additional locking lug extending tangentially of said peripheral surface of said pin, each from the respective said base toward the respective said end at respective sites disposed substantially 90° apart angularly of said peripheral surface;

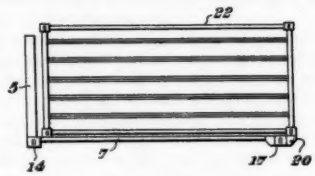
said first and additional locking lugs being disposed on the pin relative to where the pin is mounted on the bar with such angular spacing between the free ends of the respective said locking lugs and the longitudinal axis of the bar, that, for insertion of the locking lugs of the hooking-in fitting into a said anchoring opening, the bar must be angled at about 5° to about 15° to vertical about the longitudinal axis of said pin while tilted outwards from having the longitudinal axis thereof lying in an imaginary vertical plane sufficiently to permit the additional locking lug to be inserted through the respective said opening mouth above the respective said lower lip and hooked behind the respective said perimetrical edge to the left or to the right of, but above the respective said lower lip, tilted inwards to have said longitudinal axis thereof lie in an imaginary vertical plane and to cause said first locking lug to be inserted through the respective opening mouth, and, that for bringing the thus-inserted hooking-in fitting to its clamping Position, the bar must be rotated through vertical about the longitudinal axis of said pin and then past vertical through another about 20° to about 50°, and neither during such insertion nor during such angling, outward tilting, inward tilting and rotating to said clamping position need either of said locking lugs pass below the said lower lip of the respective said opening while disposed within the respective said opening.

4,537,540

TRANSPORT FRAMES FOR VEHICLES

Thomas T. Boughton, Amersham, England, assignor to T. T. Boughton & Sons, Ltd., England

Filed Dec. 16, 1982, Ser. No. 450,241
Claims priority, application United Kingdom, Dec. 23, 1981, 8138707
Int. Cl.³ B63B 25/00; B60P 1/64; B61D 45/00; B65D 19/10
U.S. Cl. 410—82 6 Claims



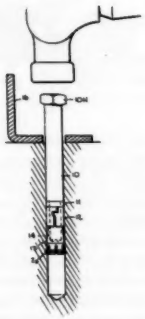
1. A rectangular transport frame comprising:
a pair of longitudinally extending members;
transverse members joining said pair of longitudinally extending members;
an upstanding extension at a first end of said frame, said upstanding extension being operative to receive a lifting hook for drawing said frame onto a vehicle;
a corner fitting provided to said frame at each corner of said frame,
each corner fitting being a substantially retangular block with a top wall, a bottom wall and four side walls,
said top wall having a generally elliptical opening therein,
said bottom wall having a generally elliptical opening therein, and
one side wall having a generally elliptical opening therein and
a twist-lock at each corner of said frame, having a first means to mate with a corresponding corner fitting on a freight container located on said frame, each said twist-lock at the end of the frame opposite to said first end being releasably secured.

4,537,541

ANCHOR BOLT ASSEMBLY

Louis N. Giannuzzi, 4 Shelter Dr., Cos Cob, Conn. 06807

Division of Ser. No. 930,741, Aug. 3, 1978, Pat. No. 4,195,547.
This application Mar. 31, 1980, Ser. No. 135,858
The portion of the term of this patent subsequent to Apr. 1, 1997, has been disclaimed.
Int. Cl.³ F16B 13/06
U.S. Cl. 411—55 4 Claims



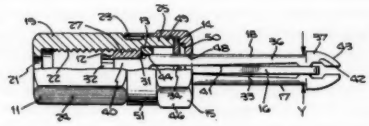
1. In combination with masonry or other material having a hole of predetermined diameter drilled therein, an anchor bolt assembly adapted to tightly fasten a fixture having a hole therein against the surface of said masonry, said assembly comprising:
A. A bolt insertable through the fixture hole into said masonry hole, the bolt being provided with an enlarged head engageable by a torque tool for turning the bolt, said bolt having a main section and a threaded rear section;
B. an expansible shell loosely encircling the upper portion of the rear section to define an annular space therebetween, the normal diameter of the shell being substantially no greater than that of the masonry hole; and
C. a wedge nut provided with an internally-threaded bore threadably received on the lower portion of the rear section, said nut having a conical upper zone and means defining a compressible lower zone whose normal diameter defines a transverse dimension which is greater than that of any other part of the assembly except for the enlarged head of the bolt and exceeds the diameter of the masonry hole to the extent that the assembly has to be driven into the masonry hole in order to insert the assembly therein, thereby subjecting the lower zone to compression preventing rotation of the nut whereby when the bolt is then turned in, the wedge nut advances axially toward the shell and the conical zone thereof enters the annular space to expand the shell and force it outwardly against the masonry hole, the lower zone remaining outside the shell and and having a configuration such that compression of the lower zone acts to constrict the internally threaded bore therein whereby when the threaded rear section of the bolt enters therein it expands the lower zone against the masonry hole to provide a first anchoring force, the expanded shell providing a second anchoring force.

4,537,542

WEDGE-TYPE LOW PROFILE FASTENER

John D. Pratt, Rancho Cucamonga, and Raymond Ramirez, Valinda, both of Calif., assignors to Monogram Industries, Inc., Providence, R.I.

Filed Apr. 19, 1984, Ser. No. 602,224
Int. Cl.³ F16B 13/04
U.S. Cl. 411—55 10 Claims



1. A wedge-type fastener comprising:
a main body portion having a first internally threaded interior section and a second smooth walled interior section;
a screw member having external threads adapted to engage and mate with the threaded interior section of said body portion, said screw member being mounted within said body portion and movable from a first position disposed in said smooth walled section to a second position threadably engaging said threaded interior section;
a pair of spaced wire members fixedly mounted at one end in said screw member;
a spacer loosely disposed between said wire members movable between a first position totally contained within and between said wire members when said screw member is in said first position and to a second position forcing said wire members apart and extending out of the end of said wire members remote from the ends thereof mounted to said screw member when said screw member moves to said second position; and
an end cap having said wire members extending there-

through encircling both said wire members and said body member and fixedly secured to said body member.

4,537,543

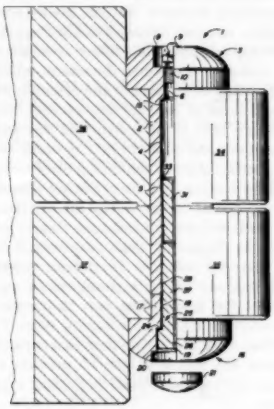
SECURITY LOCKING BOLT

Tommy L. Scott, Rte. 1, Box 322, De Berry, Tex. 75639, and Morris C. Moss, P.O. Box 602, Carthage, Tex. 75633

Filed Jul. 11, 1983, Ser. No. 512,354

Int. Cl.³ F16B *35/00, 41/00*

U.S. Cl. 411—371 **22 Claims**



1. A security locking bolt comprising a bolt body having an internal bore and bore threads provided in at least a portion of said bore; a security bolt head provided on one end of said bolt body; a locking head having a locking head body engaging the opposite end of said bolt body from said security bolt head; a locking head cavity in said locking head, said locking head cavity extending through said locking head body and communicating with said bore; a locking bolt removably recessed in said locking head cavity and extending into said bore in threadable cooperation with said bore threads; a locking bolt aperture extending axially through said locking bolt; and end cap tightly pressed into said locking head cavity and a grease fitting provided in said security bolt head and in communication with said internal bore, whereby grease inserted in said grease fitting and said internal bore causes removal of said end cap from said locking head; and engaging means in cooperation with said locking bolt for receiving a tool and securing said locking head to said bolt body responsive to manipulation of the tool.

4,537,544

METHOD OF FORMING A FOLDER FOR REPORTS OR STATEMENTS OF ACCOUNT AND COVER TO EFFECT THE METHOD

Friedrich Joost, DK 8900 Randers, Denmark

Filed Mar. 2, 1983, Ser. No. 471,492

Int. Cl.³ B42D *1/00*

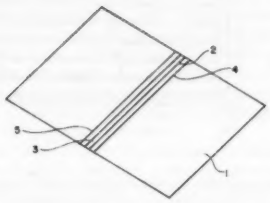
U.S. Cl. 412—5 **4 Claims**

1. A folder for documents comprising a sheet of thin, flexible material having first and second parallel spine folds or creases to define a first cover, a spine area, and a second cover; a side fold or crease in the first cover of the folder, said side fold or crease being adjacent and parallel to said first spine fold; a double-sided adhesive covering the area defined by the side fold in said first cover and a region in the second cover adjacent and parallel to the second spine fold and extending into said second cover approximately the same distance as said side fold from said first spine fold; and a removable protective film covering said double-sided adhesive.

3. A method of forming a folder of documents comprising the steps of:

a. securing a sheaf of documents along the spine edge thereof;

b. inserting the sheaf of documents into a folder which comprises a sheet of thin, flexible material having first and second parallel spine folds or creases which define a first cover, a spine area, and a second cover; a side fold or crease in the first cover of the folder, said side fold or crease being adjacent and parallel to said first spine fold; a



double-sided adhesive covering the area defined by the side fold in said first cover and a region in the second cover adjacent and parallel to the second spine fold and extending into said second cover approximately the same distance as said side fold from said first spine fold; the spine edge of said sheaf of documents being in line with and in contact with the spine area of said folder;

c. folding said folder over said sheaf of documents, and

d. pressing the outside of the folder in the area covered by the double-sided adhesive whereby the sheaf of documents is securely bound therein.

4,537,545

METHOD AND APPARATUS FOR ALIGNING A PILE OF SHEETS PROVIDED WITH PERFORATIONS FOR BINDINGS

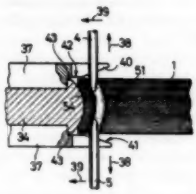
Otto Kunzmann, Neuffen, Fed. Rep. of Germany, assignor to bielomatik Leuze GmbH & Co., Fed. Rep. of Germany

Filed May 16, 1983, Ser. No. 494,967

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1982, 3220814

Int. Cl.³ B24B *5/08, 5/10*

U.S. Cl. 412—7 **15 Claims**



1. A method for aligning a pile of sheets having perforations for receiving bindings, comprising the steps of:

moving two sets of prongs in opposite directions to insert said prongs into the perforations from opposite sides of the pile, the prongs of both sets being parallel to one another;

successively pressing an outer edge of the sheets in the pile against a shaped surface of a desired curvature from the center of the pile outwards for shaping the outer edge of the pile in correspondence with said shaped surface, by pressing tip portions of the prongs against inside edges of the perforations of successive sheets and holding both sets of prongs parallel to each other, and simultaneously

urging said prongs toward the shaped surface while moving the prongs in opposite directions to be withdrawn from the pile.

4. An apparatus for aligning a pile of sheets having perforations for receiving bindings, comprising:

a shaped part having a surface conforming to a desired curvature for an edge of the pile of sheets;

two sets of generally-linear prongs, each set having a plurality of parallel prongs aligned for insertion in the perforations, the prongs of each set projecting opposite the prongs of the other set; and,

driving means for the sets of prongs, adapted to insert the prongs into the perforations by moving each set relative to the other in a plane comprising the axes of the perforations before the prongs are inserted, and to withdraw the sets of prongs from the perforations, the prongs remaining aligned parallel to each other and remaining in said plane, the driving means having a resilient urging means to urge and move the prongs toward the shaped part while withdrawing the prongs from the perforations, whereby the pile of sheets is aligned by successive alignment of each sheet.

4,537,546

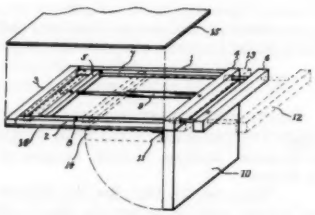
BOOKBINDING DEVICE

Robert L. Lucas, 679 Sanchez St., San Francisco, Calif. 94114

Filed Jul. 25, 1983, Ser. No. 516,703

Int. Cl.³ B42C *13/04*

U.S. Cl. 412—10 **4 Claims**



1. A bookbinding apparatus for use in performing several different binding operations comprising:

an elongated frame having two ends and two sides, one of said ends comprising a first, fixed, clamping surface which surface extends generally perpendicular to the longitudinal axis of said frame;

first means comprising a second, movable, clamping surface, said means being mounted to said frame by second means which permits the first means to be moved along the longitudinal axis of said frame from a first, open, position to a second, clamping, position whereby a book may be clamped between said two surfaces;

a flap hinged to said frame near said one end so as to pivot between an open position generally perpendicular to said longitudinal axis of said frame and a closed position generally parallel to said axis;

whereby said apparatus may be supported for use in a bookbinding operation near the edge of a work surface with either the frame or the flap resting on said surface.

4,537,547

MANIPULATOR

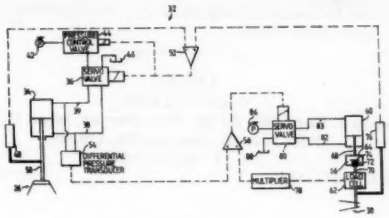
Geoffrey V. Cole, Newbury, England, assignor to The United Kingdom Atomic Energy Authority, London, England

Filed Sep. 22, 1982, Ser. No. 421,426

Claims priority, application United Kingdom, Oct. 23, 1981, 8132084

Int. Cl.³ B25J *13/02*

U.S. Cl. 414—5 **6 Claims**



1. A manipulator comprising, a slave arm with at least one movement thereof operable by fluid power means; a manually operated grip means for controlling the movement of the slave arm; positional transducers at the slave arm and the grip means to provide positional signals representing the positions of the slave arm and of the grip means, means for comparing the positional signals and providing a difference signal representing the difference between the positional signals, and a servovalve and a pressure control valve each responsive to the difference signal and arranged to operate the fluid power means; means for monitoring the fluid pressure of the fluid power means and providing a pressure signal, a load transducer for monitoring the load on the grip means and providing a load signal, comparator means for comparing pressure and load signals from the pressure monitoring means and the load transducer and providing an error signal representing the difference between the pressure and load signals, and a fluid power means connected to the grip means and operable in response to the error signal so as to impose on the grip means a load proportional to the said fluid pressure.

4,537,548

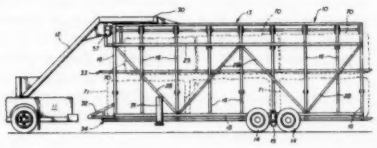
COMBINATION HAY HAULER AND STOCK TRAILER

Billy J. Lockhart, c/o M and A Petroleum, Inc., P.O. Box 89, Lampasas, Tex. 76550

Filed Dec. 12, 1983, Ser. No. 560,242

Int. Cl.³ A01D *90/02*

U.S. Cl. 414—24.5 **11 Claims**



1. An agricultural vehicle for collecting and transporting hay bales at different levels, comprising

a mobile wheeled frame for movement over the ground and having an open forward end, an open trailing end, and an open bottom,

an upper lifting and supporting assembly having longitudinally extending lifting members movably mounted on opposite sides of said frame for vertical movement relative thereto,

a lower lifting and supporting assembly having longitudinally extending lifting members movably mounted on

opposite sides of said frame for vertical movement relative thereto,

said upper and lower lifting and supporting assemblies each having an initial lower position adjacent to ground level and nested together in such lowered portion,

means on said frame operatively connected to said upper and lower lifting and supporting assemblies for moving same vertically along said frame from said lower nested position to spaced raised load supporting positions independently or together, and

means for connecting said frame to a prime mover for transporting said frame.

4,537,549

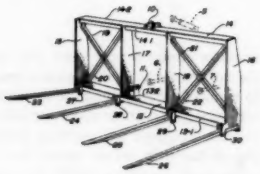
BALE CARRIER

Kenneth J. Knels, Rte. #2 Box 93A, Fairview, Mont. 59211

Filed May 14, 1984, Ser. No. 610,196

Int. Cl.³ A01D *87/12*

U.S. Cl. 414—24.5 **17 Claims**



1. A bale carrier of elongated character for three-point hitch mounting on a tractor so as to extend transversely to the direction of travel by the tractor, comprising

a unitary elongated mainframe having a rectangular perimeter the longer members of which are formed by a lower horizontal base bar which has an upper inwardly facing surface of generally plate-like character and an upper header bar which has a lower inwardly facing surface of generally plate-like character, and the shorter members of which are formed by end plates lying in planes perpendicular to the base and header bars, the members of said rectangular perimeter having opposing transversely outward surfaces characterized as a face side surface on one side and a far side surface on the other,

said elongated mainframe having an interior frame structure consisting essentially of two interior plates spaced from each other and from the end plates, with said interior plates lying in planes parallel to the planes of the end plates and united to the base and header bars, and two X braces of substantially equal configuration, with a said X brace between each end plate and the interior plate most adjacent thereto and having the lower arms of the X brace united at their termini to the base bar at intersections formed by a said plate with the base bar, and having the upper arms of the X brace united at their termini to the header bar at intersections formed by a said plate with the header bar, the central portion of the elongated mainframe embracing the two interior plates being characterized as the medial portion thereof,

three-point means for receiving a three-point hitch of a tractor, said three-point means being located medially on the mainframe, the three-point means consisting essentially of an upper bracket means medially rigidly fixed on the header bar for receiving the upper link of a three-point hitch and a pair of spaced lower bracket means united to the base bar for receiving the pair of lower links of a three-point hitch, and

bale-supporting teeth mounted on the base bar and extending perpendicularly outward from the face side surface of the mainframe, said teeth being adapted to carry more than one bale with the bales carried in laterally spaced relationship with respect to each other.

4,537,550

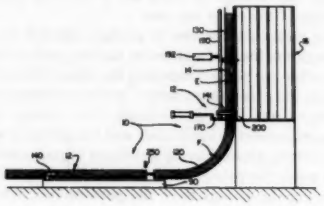
AUTOMATIC STACK DEVELOPING AND LOADING SYSTEM

Wallace W. Mojden, Hinsdale, and Robert E. Darr, Chicago, both of Ill., assignors to Fleetwood Systems, Inc., Countryside, Ill.

Filed Sep. 29, 1983, Ser. No. 537,725

Int. Cl.³ B65G *57/16*

U.S. Cl. 414—46 **13 Claims**



1. Apparatus for supplying can ends or the like to a downstream processing unit, such as rotary carousel feed unit or the like, said apparatus comprising; in combination; a generally horizontal trough section for accumulating in stacked array can ends delivered from an upstream source; a transfer pocket disposed generally vertically and above said trough section for receiving a quantity of can ends in stacked array from said trough section; an intermediate transition chute means of generally arcuate configuration extending upwardly from said trough section to said transfer pocket to interconnect said trough section and said transfer pocket; transport means for driving at least a portion of the stacked accumulated ends in said trough sectiona long said trough section and upwardly into said arcuate chute means and further into said transfer pocket; means for maintaining a quantity of stacked ends in said vertically disposed transfer pocket upon retraction of said transport means which retractive movement will result in the provision of a gap below the quantity of stacked ends; and pusher means disposed adjacent said transfer pocket for transferring a quantity of stacked ends supported therein laterally from said transfer pocket to a downstream processing unit.

4,537,551

METHOD AND MEANS OF CHARGING ELECTROTHERMIC SMELTING FURNACES

Harald Krogsrud, Gjettum, Norway, assignor to Elkem a/s, Oslo, Norway

Filed Apr. 25, 1983, Ser. No. 488,418

Claims priority, application Norway, May 3, 1982, 821454

Int. Cl.³ F23K *3/00*

U.S. Cl. 414—199 **12 Claims**

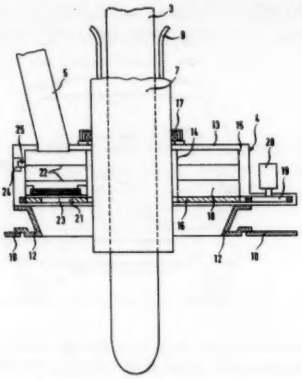
2. Apparatus for charging an electrothermic smelting furnace having at least one electrode comprising an annular chamber concentrically disposed about the electrode and rotatable with respect thereto, said annular chamber including a bottom member, said bottom member having at least one opening therein for communication with the furnace, inner and outer concentric walls resting on said member, means for closing said opening in the bottom member and means for rotating said annular chamber wherein the walls and bottom member of said annular chamber are rotatable with respect to each other and wherein the bottom member is driven by said means for rotating and further comprising a stop member for preventing further rotation of said walls while the bottom member continues to rotate.

4. In an electrothermic smelting furnace having at least one electrode, a chamber surrounding said electrode for feeding charge into said furnace said chamber having an inner wall, an outer wall positioned in spaced relationship to said inner wall, a bottom member having at least one aperture therein and a

closure member to open and close said aperture for feeding charge down into the furnace, the method which comprises the steps of:

(a) causing relative rotation around the electrode between said bottom member and closure member to bring said closure member into a first position to close said aperture;

(b) simultaneously rotating said bottom member and closure



member together around the electrode with the closure member in position closing said aperture while feeding furnace charge into said chamber;

(c) causing relative rotation around the electrode between said bottom member and closure member to bring said closure member into a second position to open said aperture whereby charge in the chamber is free to drop down through said aperture into the furnace.

4,537,552

APPARATUS FOR FEEDING COMPONENTS TO A WORK STATION

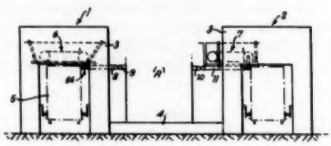
Robert K. Slee, London, England, assignor to South London Electrical Equipment Company Limited, London, England

Filed Sep. 26, 1983, Ser. No. 535,951

Claims priority, application United Kingdom, Jan. 14, 1983, 8300960

Int. Cl.³ B65H *1/00*

U.S. Cl. 414—222 **11 Claims**



1. Apparatus for loading components into a machine, including,

a main frame, a docking station in said main frame, a mobile storage device for said components in the form of a cart moveable into and out of said docking station in said main frame, loading means to transfer said components from the cart to said machine, mounting means for movably mounting the loading means on said main frame, means to bring the loading means and the cart into a cooperative relationship by relative movement therebetween, at least part of the loading means being movable relative to the main frame during said relative movement to align the cart with the loading means in two mutually perpendicular axes,

a plurality of component carriers in the cart, each component carrier being adapted to hold a plurality of said components, each cart having a loading station, and the apparatus having drive means for selectively moving each carrier to said loading station to enable the components in the carrier to be transferred by said loading means from the cart to the machine, the loading means including control means responsive to the position of a carrier in the loading station for controlling the drive means to align the carrier in the loading station with said loading means in an axis perpendicular to said two mutually perpendicular axes.

4,537,553

ARRANGEMENT IN A SILO OR THE LIKE FOR STORING PULVERULENT, GRANULAR OR LUMPY MATERIAL, SUCH AS COAL

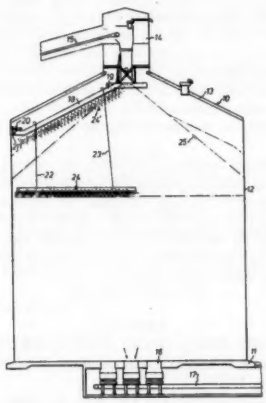
Sven A. Andersson, Tyringe, Sweden, assignor to Nils Weibull AB, Sweden

Filed May 12, 1983, Ser. No. 494,086

Claims priority, application Sweden, May 17, 1982, 8203068

Int. Cl.³ B65G *65/46*

U.S. Cl. 414—302 **1 Claim**



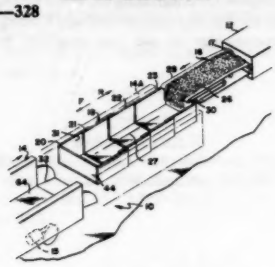
1. In a silo or the like for storing pulverulent, granular or lumpy material, such as coal, and comprising a side wall, a floor, a roof which is supported by said side wall at an angle of inclination that substantially corresponds to the angle of repose of the material to be stored in the silo, a central material inlet opening in said roof, at least one central discharge opening in said floor, and at least one screw conveyor which extends substantially from a central axis of the silo to a location adjacent to said side wall, a supporting beam located in said silo adjacent to said roof and rotatable about the central axis of the silo, said supporting beam being inclined downwardly from said material inlet opening toward said side wall substantially parallel to said roof, said conveyor being suspended from said beam by wires adjustable in length independently of each other.

4,537,554

SHUTTLE CAR LOADING SYSTEM

Earl R. Collins, Jr., La Canada, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 14, 1983, Ser. No. 457,990
Int. Cl.³ B65G *67/06*
U.S. Cl. 414—328 **3 Claims**



1. A mineral storage bin apparatus for holding newly mined material for loading it in a shuttle car comprising:

a bin having a plurality of bin sections, including forward and rearward bin sections, which telescope along a largely horizontal axis, said bin sections having side walls, open upper ends for receiving pieces of mined material and bottom walls for supporting the weight of the material; a shuttle car;

means for supporting said bin sections to allow said shuttle car to move thereunder;

said shuttle car, having side walls and having a bottom wall which is thin and low enough to slip under said bin sections while the side walls of the car lie on opposite sides of the side walls of the bin sections, and motor means for driving said car to move it so said bottom wall slips under said bin sections and the side walls of the car lie on either side of the side walls of the bin sections and to then move said car away from said bin;

said forward bin section having an openable forward end, and

actuator means coupled to at least one of said sections, for collapsing said sections along said largely horizontal axis including moving said forward bin section rearwardly while its forward end is open, so the material formerly supported by the bottom of a bin section can fall down, to release the material held therein to fall out into said shuttle car lying under the sections.

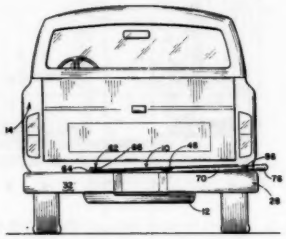
4,537,555

WIRE ROPE SPARE TIRE CARRIER

Linsey L. Combs, Seminole, Okla., assignor to W.W.B. Developers, Midvale, Utah

Continuation of Ser. No. 581,138, Feb. 17, 1984, abandoned, which is a continuation of Ser. No. 378,911, May 17, 1982, abandoned. This application Jan. 18, 1985, Ser. No. 693,223
Int. Cl.³ B62D *43/04*
U.S. Cl. 414—463 **5 Claims**

1. A vehicle spare tire carrier comprising a stationary non-rotatable roll bar securable to the vehicle adjacent the storage position of the tire, pulley means secured to the vehicle in spaced relation with respect to the roll bar, an elongated lever arm having one end pivotally secured to the vehicle, the pivot point thereof being in spaced relation with respect to the pulley assembly and having an axis of rotation substantially parallel to the axis of the pulley means, a cable attachment point provided on the the lever arm in spaced relation with respect to the pivot point thereof, a flexible cable extending from the attachment point on the lever arm and around the pulley means and over the roll bar and terminating at a connection with a tire carrier bracket means, the length of the cable being such that when the lever arm is fully pivoted in a first direction the tire may be removed from the vehicle and when the lever arm is pivoted in a second direction the spare tire is pulled into tight engagement with the vehicle and latching means securable to the vehicle for receiving one end of the lever arm thereagainst in one pivotal direction thereof, and means cooperating between the latching means and the lever arm for removably securing the lever arm in said engagement with the latching means, wherein the latching means comprises a latching bracket secured to said rear bumper, said latching bracket being of an arcuate configu-



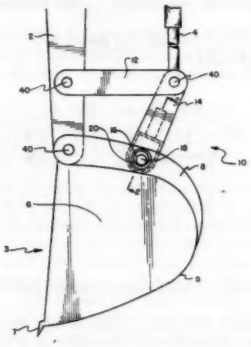
ration for receiving the lever arm therein, and wherein outwardly extending eye means is provided on the outer periphery of the lever arm and disposed in substantial alignment with the latching bracket member in one position of the lever arm, and said latching bracket is provided with slot means for receiving the eye member therethrough for securely retaining the lever arm means in engagement therewith, and including lock means engagable with the eye member extending through the slot means for further securing the lever arm means against accidental disengagement with the latching bracket member.

4,537,556

RECIPROCATING BACKHOE BUCKET

Emery C. Tharp, 2520 Fox Harbor Dr., Indianapolis, Ind. 46227

Filed May 12, 1983, Ser. No. 493,921
Int. Cl.³ B66C *23/00*
U.S. Cl. 414—725 **3 Claims**



1. A reciprocating device for a backhoe bucket which includes a downwardly extending dipper stick having respective ends pivotally connected and supporting an associated pair of bucket brackets, the bucket brackets having a contour complemental to an end wall of the bucket to support same, and a bucket curl cylinder and piston connected to the dipper stick by means of transverse links, similarly pivoted, and a pair of connecting links extending from the intersection of the bucket

curl cylinder/piston and the transverse link to a further area on the bucket bracket, the reciprocating device including:

shaft means being the connection between the connecting links and the bucket brackets,

said shaft means rotatably supported by the connecting links by a bearing means and provided with means for rotating said shaft, said rotating means encased in a housing disposed between said pair of connecting links, and

cam means associated with said shaft means and connecting the connecting links to the bucket brackets, whereby rotation of said shaft means imparts reciprocal oscillating motion to the bucket bracket and therefor the backhoe bucket.

4,537,557

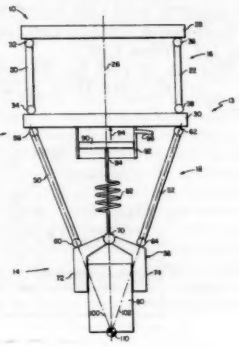
REMOTE CENTER COMPLIANCE GRIPPER SYSTEM

Daniel E. Whitney, Arlington, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Apr. 23, 1982, Ser. No. 371,197

Int. Cl.³ B25J *17/02*

U.S. Cl. 414—735 **8 Claims**



1. A remote center compliance (RCC) gripper system comprising:

support means;

at least three compliance members mounted to said support means and disposed along conical radii from a focus;

an articulated gripper mechanism interconnected with one end of said compliance members and including a base having a generally centrally disposed joint and having a plurality of fingers extending from siad base; and

means for applying a force between said centrally disposed joint and said support means to fix said joint and apply a force to said compliance members.

4,537,558

MULTI-STAGE HYDRAULIC MACHINE AND CONTROL METHOD FOR A MULTI-STAGE HYDRAULIC MACHINE

Sachio Tsunoda, Yokohama, and Shinsaku Sato, Ebina, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 27, 1982, Ser. No. 343,325

Claims priority, application Japan, Feb. 3, 1981, 56-13800; Feb. 3, 1981, 56-13801

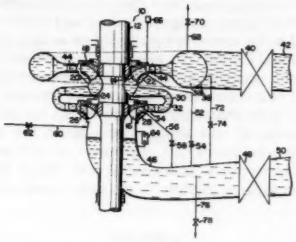
Int. Cl.³ F01D *17/00*

U.S. Cl. 415—1 **8 Claims**

1. A control method for a multi-stage hydraulic machine which comprises a rotatable shaft; a plurality of runners fixed to said shaft and arranged from a highest-pressure stage to a lowest-pressure stage; runner chambers which, respectively, house said runners; a return channel for connecting adjacent ones of said runner chambers with each other; movable wicket gates provided at least in said highest-pressure stage and capable of moving between a position in which said movable wicket gates block the channel and a position in which said movable wicket gates open the channel; a casing connected to said highest-pressure stage, and an inlet valve disposed between said casing and a penstock, said method comprising

a first step of causing said movable wicket gates and said inlet valve to block the channel;

a second step of feeding air to an upper portion of a draft tube which is connected to a lower portion of said lowest-pressure stage after the channel is substantially blocked by said movable wicket gates;



a third step of discharging water in said return channel and said lowest-pressure stage runner chamber adjacent thereto through a lowest-pressure stage drain pipe after a water level in said draft tube is lowered to a predetermined value;

a fourth step of discharging water in said highest-pressure stage runner chamber to said draft tube through a highest-pressure stage drain pipe after a pressure in said highest-pressure stage runner chamber is lowered below a predetermined pressure; and

a fifth step of interrupting the operation of air-feeding in said second step after the water level in said draft tube is stabilized at a predetermined value.

4,537,559

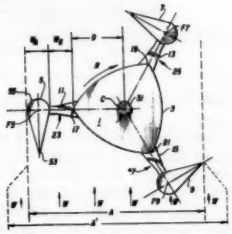
VENTURI ROTOR APPARATUS FOR THE GENERATION OF POWER

Christian W. Herrmann, 515 E. 35th St., Joplin, Mo. 64801, assignor to Christian W. Herrmann and Anna Herrmann, both of Joplin, Mo.

Filed Sep. 23, 1983, Ser. No. 535,099

Int. Cl.³ F03D *3/06*

U.S. Cl. 416—119 **15 Claims**



1. A venturi rotor apparatus for producing power from the rotation thereof, said apparatus comprising:

(a) support means;

(b) a central core means having an outer surface with verticies thereon, mounted on said support means for rotation about a central axis through said core means;

(c) a plurality of support arms fixed to said central core means and extending radially outward therefrom; and

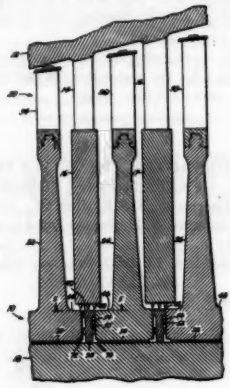
(d) at least three airfoil means each airfoil means having leading and trailing edges, with respect to the direction of rotation, wherein said leading edge is arcuate and wider than said trailing edge, and side surfaces extending between the ends of the leading edge and the trailing edge, said airfoil means being fixed to a radially extended portion of said support arms, and wherein the junction of said side surfaces and ends of said leading edge of each airfoil means is positioned on a radial line extending from the center of the central axis of the center core means through a corresponding vertex of the outer surface, and wherein a gap is formed between the surface of said central core means and the junction of one of said side surfaces and the end of said leading edge of each of said airfoil means, each of said airfoil means being aligned on an axis parallel to the axis of said central core means, such that fluid flow having at least a component in a direction perpendicular to the axis of said central core means, flows through at least one of said gaps producing a venturi effect for enhancing the movement of said airfoil means about the axis of said central core means, the movement of said airfoil means applying torque to said central core means through said support arms to thereby rotate said central core means.

4,537,560

RADIAL KEY FOR STEAM TURBINE WHEELS

Eloy V. Emeterio, Amsterdam; Robert E. Deallenbach, Schenectady; Martin F. O'Connor, Scotia, and Oleg Klufas, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 29, 1984, Ser. No. 614,902
Int. Cl.³ F01D *5/06*
U.S. Cl. 416—198 A **18 Claims**



1. In a steam turbine, a rotor comprising:

a rotatable shaft;

a plurality of wheels axially spaced along said shaft and respectively affixed thereto by an interference shrink fit between the respective radially inner surface of said wheels and said shaft, each wheel of said plurality of wheels carrying a plurality of circumferentially aligned steam turbine blades at the radially outermost portion of said each wheel, at least two adjacent wheels, each of said at least two adjacent wheels respectively comprising:

a hub section at the radially inner portion of the wheel, said hub extending axially from both axial ends of the wheel, said hub including an axial end face surface at each axial end of the hub;

each opposing axial end face respectively defining at least one substantially radial slot thereon, each said radial slot being open to the periphery of the respective hub and extending to said shaft, each said radial slot being axially aligned with the respective radial slot on the respective opposing end face to form a substantially radial keyway between the hubs of said at least two adjacent wheels;

retaining means fixedly secured to the hub section of one of the opposing axial end faces for preventing outward radial movement of any key to be disposed in the keyway; and

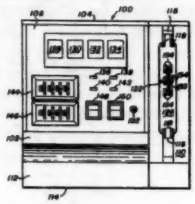
at least one key disposed in said keyway, said key comprising a body portion and at least a pair of spacing means for axially spacing said key from respective axial end walls of said keyway, said key including at least one flange extending outwardly from said body portion and engaging said retaining means said key further including a radially inner extremity in close proximity to said shaft, and a leading and a trailing face, said leading and trailing face respectively contacting a leading and a trailing sidewall of said keyway, respectively.

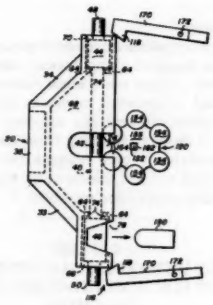
4,537,561

PERISTALTIC INFUSION PUMP AND DISPOSABLE CASSETTE FOR USE THEREWITH

Piritheos E. Xanthopoulos, San Jose, Calif., assignor to Medical Technology, Ltd., Fresno, Calif.

Filed Feb. 24, 1983, Ser. No. 469,421
Int. Cl.³ F04B *43/12, 21/00*
U.S. Cl. 417—63 **5 Claims**





1. A peristaltic pump assembly, comprising:

a pump arrangement including a pump cassette housing having portions defining a vertical cassette aperture located adjacent a pump housing enclosing a pump mechanism, said pump cassette housing having means for supporting and aligning a disposable cassette in an operative position relative to said pump mechanism, said pump mechanism having securing means for securing said disposable cassette within said pump cassette housing and a locking mechanism to securely support and retain said cassette in an operative position relative to said securing means while said cassette is positioned in said pump cas-

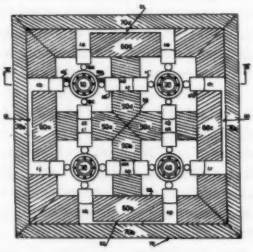
sette housing, said locking mechanism including a plurality of locking arms and hooks with each arm articulating about a pivot shaft connecting said pump cassette housing with each locking arm and one of said locking hooks located on each locking arm to physically restrain said cassette in its operative position relative to said pump mechanism, and means located in said pump cassette housing for cooperating with said cassette in a predetermined manner for peristaltically pumping fluid; said cassette having a hollow conduit arrangement including a predetermined length of elastic tubing and first and second connectors with opposite end portions of said tubing being joined to said first and second connectors forming leak-proof junctions with said tubing such that fluid may be pumped through said hollow conduit arrangment; said cassette further including a single piece cartridge structure of dimensions for fitting in said cassette aperture and being supported by said pump cassette housing having a first means for removably mounting an end portion of said first connector and a second means for removably mounting an end portion of said second connector to permit removal aand replacement of said connectors without dismantling said cartridge, and said tubing being tautly suspended and accessible to said pump mechanism along a portion of the base of said cartridge structure so that said tube is longitudinally elongated in a predetermined manner when fitted in the pump cassette housing; said cassette including a U-shaped pump shaft opening symetrically positioned along at least one side of said cartridge to expose a predetermined length of said elastic tubing; said U-shaped pump shaft opening located in an off-center position in the wall of said cartridge structure to expose a predetermined section of said tubing; wherein said operative position of the cassette causes said tube to be longitudinally elongated about the pump rotor rollers so that peristaltic pumping can be accomplished on said tube, and said elongated tube creates a spring-like tension on said cassette cartridge such that said cassette cartridge is forced out of the pump cassette housing if not restrained.

4,537,562

PUMP

Malte Lindmark, and Margareta Lindmark, both of Sibyllegatan 53, 114 43 Stockholm, Sweden

Filed Feb. 23, 1984, Ser. No. 582,896
Claims priority, application Sweden, Jan. 5, 1982, 8200028
Int. Cl.³ F04B *1/28*
U.S. Cl. 417—215 **14 Claims**



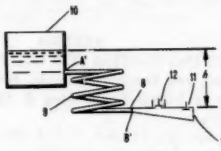
1. A pump comprising an inlet through which passes a medium intended for pumping, and an outlet through which passes the medium pumped by the pumping elements of the pump, and a drive source acting upon four rotatable shafts having cams, said pumping elements arranged diametrically to each shaft so that they are driven by the cams on said shafts, said four rotatable shafts being situated so as to interact with a number of the pumping elements, a first diametrically arranged pair of said shafts constituting a rotating pair having the same direction of rotation and with a fixed opposite phase, a second diagonally arranged pair of said shafts constituting a similar rotating pair having the same mutual direction of rotation and with a fixed opposite relative phase, and wherein the first pair of shafts has a first direction of rotation while the second pair of shafts has an opposing direction of rotation, and wherein the phase of one of the pairs of shafts is adjustable in relation to the phase of the second pair of shafts.

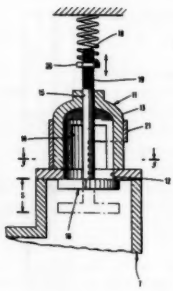
4,537,563

RAM PUMPS

Tetsuo Ogawa, Kawasaki, Japan, assignor to Katsuhiko Ohki, Briarcliff Manor, N.Y.

Filed Apr. 14, 1983, Ser. No. 484,870
Int. Cl.³ F04F *7/02*; F16K *51/00*
U.S. Cl. 417—226 **6 Claims**





1. A ram pump powered by a fluid head created by a reservoir located above said pump comprising:

(a) a pump housing;

(b) a lead pipe connected to the reservoir and said pump housing for inflow of fluid from the reservoir into said pump housing;

(c) a release valve mechanism having:

(1) a release valve outlet defined by said housing for exhaust of fluid from said pump;

(2) a release valve cup attached to said housing and cooperating with said outlet, said cup having cup slots in communication with said outlet;

(3) an adjusting ring having ring slots through said ring in a radial direction, said ring adapted for communication with and slidable rotation about said release valve cup, said ring slots cooperating with said valve cup slots to form an outlet port having a cross section, such that rotation of said ring varies said cross section;

(4) a release valve reciprocating valve having a stem portion slidably mounted in said valve cup for movement from an open position, to a closed position, such that said release valve reciprocating valve blocks said outlet in said closed position;

(5) means for biasing said release valve reciprocating valve in said open position, such that a bias force generated thereby when said release valve reciprocating

valve is in said closed position is between approximately 2% and 12% of a hydrostatic pressure generated by said reservoir fluid head on said closed release valve reciprocating valve; and

(d) a lifting mechanism having:

(1) a lifting valve outlet defined by said housing;

(2) a lifting valve outlet face on said lifting valve outlet;

(3) a reciprocating lifting valve having a valve head, said valve head cooperating with said lifting valve outlet face to contact said lifting valve outlet face and seal said lifting valve outlet when the said reciprocating lifting valve reciprocates to a closed position; and

(4) means for biasing said reciprocating lifting valve to said closed position, a bias force generated thereby establishing a contact pressure between said head and lifting valve outlet face greater than approximately 10 g/cm^2 without fluid in said pump.

4,537,564

PUMPING SYSTEM FOR OIL PRODUCTION

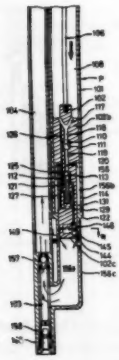
Isao Yamato, and Tominori Yamada, both of Tamano, Japan, assignors to Mitsui Engineering & Shipbuilding Co., Ltd., Tokyo, Japan

Division of Ser. No. 318,981, Nov. 6, 1981, Pat. No. 4,451,212. This application Mar. 8, 1984, Ser. No. 587,801

Claims priority, application Japan, Nov. 17, 1980, 55-160752; Dec. 30, 1980, 55-187412

Int. Cl.^{3} F04B *47/02*

U.S. Cl. 417—313 **3 Claims**



1. A pumping system for oil production, comprising:

a hydraulic unit set on the ground and adapted to send out a high-pressure oil having a viscosity lower than that of crude oil to be drawn up; and

a pump unit set in an oil well and adapted to draw up crude oil, said pump unit including,

a pump cylinder,

a plunger adapted for reciprocating movement in said pump cylinder, said plunger being provided with an oil reservoir adapted to receive the high-pressure oil sent from said hydraulic unit thereto,

a sucker rod attached to said plunger, said sucker rod also being atached to a reciprocating mechanism set on the ground, said plunger being reciprocatingly moved in response to the reciprocating motion of said reciprocating mechanism,

a clearance formed between that portion of the outer circumferential surface of said plunger which is on the side of a cylinder chamber and the inner circumferential surface of said pump cylinder, said clearance communicating with said oil reservoir, the high-pressure oil being ejected from said clearance along the inner surface of said pump cylinder into said cylinder chamber while said plunger is reciprocatingly moved in said pump cylinder,

a hydraulic piston provided in said plunger and adapted for reciprocating movement between a pair of opposing oil chambers, such that said high-pressure oil is received in each of said opposing oil chambers, and

a pair of communicating lower chambers formed within said plunger, said lower chambers containing a slider adapted for reciprocating movement therebetween in response to said high-pressure oil from said oil chambers, the reciprocating movement of said slider causing the high-pressure oil to be pumped into said oil reservoir.

4,537,565

ELECTROMAGNETICALLY OPERATED DIAPHRAGM PUMP

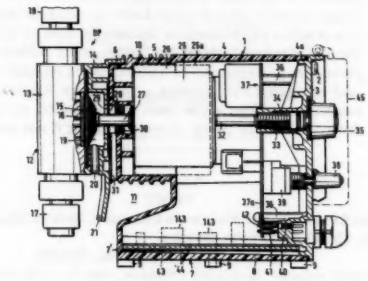
Friedrich Edler, Bammental, Fed. Rep. of Germany, assignor to Chemie und Filter GmbH Verfahrenstechnik KG, Heidelberg, Fed. Rep. of Germany

Filed Feb. 3, 1983, Ser. No. 463,407

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1982, 3204534

Int. Cl.^{3} F04B *43/04, 17/04;* H02K *5/18*

U.S. Cl. 417—413 **21 Claims**

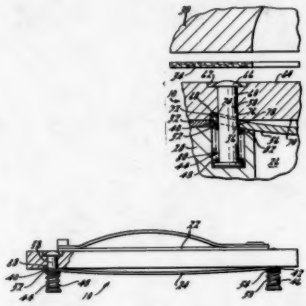


1. A fluid flow machine, comprising an axial piston pump, particularly a diaphragm pump; an electromagnet adjacent to and arranged to operate said pump and to thereby generate heat, said electromagnet having an at least substantially cylindrical external casing surface; and a housing including a partition disposed between said pump and said electromagnet, a substantially cylindrical section adjacent to said partition, spacedly surrounding at least a portion of said external casing surface and defining therewith a gap of substantially constant width for transfer of heat from said cylindrical external casing surface to said cylindrical section, said cylindrical section having an outer surface which is exposed to the surrounding atmosphere and external heat dissipating projections at least some of which extend circumferentially of said cylindrical section, said housing further including an additional section integral with and supporting said cylindrical section and the cross-sectional area of the interior of said additional section exceeding the cross-sectional area of the interior of said cylindrical section, said additional section extending downwardly beyond said cylindrical section and said housing also including a supporting leg rigid with said additional section and having an extension extending toward said pump and spaced apart from and disposed at a level below said cylindrical section, said cylindrical section, said additional section and said leg of said housing consisting of a synthetic plastic material.

4,537,566
VALVE ASSEMBLY FOR A COMPRESSOR

Jaroslav Blass, and Michael A. Deal, both of Sidney, Ohio, assignors to Copeland Corporation, Sidney, Ohio

Filed May 10, 1984, Ser. No. 609,098
Int. Cl.[3] F04B *39/10*; F16K *15/14*
U.S. Cl. 417—569 7 Claims

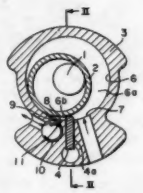


1. A valve assembly for a compressor comprising:
a valve plate having a gas passage extending therethrough;
an elongated valve member having a portion overlying said passage and operative to selectively control flow of gas therethrough;
resilient biasing means acting on said valve member adjacent said one end for exerting a moment on said valve member adjacent one end thereof, said moment being operative to normally position said portion in slightly spaced relationship to said valve plate when said valve member is in an at rest position; and
fastener means extending from said valve plate for retaining said biasing means and said valve member in assembled relationship with said valve plate.

4,537,567
ROLLING PISTON TYPE COMPRESSOR

Susumu Kawaguchi, Shizuoka, and Ken Morinushi, Kobe, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 15, 1983, Ser. No. 552,026
Claims priority, application Japan, Nov. 29, 1982, 57-208771; Feb. 2, 1983, 58-15796
Int. Cl.[3] F04C *29/00*
U.S. Cl. 418—63 4 Claims

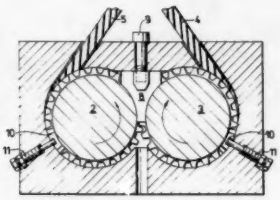


1. A rolling piston type compressor, comprising:
a cylinder;
a piston eccentrically rotatably mounted along an inner peripheral surface of said cylinder;
a vane mounted in said cylinder and engageable with the outer peripheral surface of said piston for reciprocating movement therealong and defining within said cylinder a low pressure chamber and a high pressure chamber, said cylinder including discharge port means formed entirely therein for discharging compressed gas outside said cylinder; a discharge valve provided in said discharge port means and escape groove means formed in an inner peripheral wall of said cylinder; and
means for communicating said escape groove means with said discharge port means wherein said escape groove means has a length which is in a range of 1.5 to 4 times as long as a diameter portion of said discharge port means, has a maximum depth set to be from 5 to 25% of the diameter of said discharge port means and has a width equal to or greater than the diameter of said discharge port means.

4,537,568
FORCE PUMP

Gösta Larsson, Värnamo, Sweden, assignor to Jochnick & Norrman Press AB, Värnamo, Sweden

Continuation of Ser. No. 418,356, Sep. 15, 1982, abandoned. This application Nov. 23, 1984, Ser. No. 674,479
Int. Cl.[3] F04C *2/18, 13/00, 15/00*
U.S. Cl. 418—202 4 Claims



1. In a gear pump for injection molding and extrusion of rubber and other elastomers, said gear pump comprising two gears (2,3) mounted in a housing and in engagement with each other, two entrance holes for introduction of strip starting material (4,5) into the spaces between said gears (2,3) and said housing, mid-sections of said gears being provided with circumferential grooves (7) against which the teeth of said gears terminate, the improvement comprising a removable tongue (8) inserted into said grooves (7) between said gears (2,3) in the region where they are in engagement, said tongue (8) filling less than one quarter of the circumference of each of said grooves and pointing counter to the direction of rotation of said gears (2,3), dividing-and-sealing members (10,11) being inserted into said grooves (7) of said gears (2,3) at locations in said housing between the region where said gears (2,3) are in engagement and the respective entrance hole, and a channel disposed at said circumferential grooves (7) and opposite said tongue (8) for discharging the product out of the region where said gears are in engagement.

4,537,569
HOT ISOSTATIC PRESSING APPARATUS

Akira Asari, Osaka; Hidehiro Tsuzuki, Kobe; Yoichi Inoue, Hyogo, and Takahisa Tabuchi, Kobe, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Nov. 28, 1983, Ser. No. 555,620
Claims priority, application Japan, Jan. 7, 1983, 58-968[U]
Int. Cl.[3] B30B *11/00*
U.S. Cl. 425—405 H 4 Claims

1. A hot isostatic pressing apparatus comprising:
(a) a vessel frame;
(b) a press frame swingably mounted on said vessel frame;
(c) an auxiliary station located adjacent to said vessel frame;
(d) a hot isostatic pressing vessel having a bottom opening mounted in said press frame;
(e) a plurality of detachable bottom lids each of which is sized and shaped to fit into and to plug the bottom opening in said hot isostatic pressing vessel;
(f) a plurality of auxiliary cylinders supported on said auxil-

iary station along a central horizontal extension of said hot isostatic pressing vessel, said auxiliary cylinders being provided for cooling or preheating purposes, each of said plurality of auxiliary cylinders having a bottom opening sized and shaped so that said detachable bottom lids will fit into and plug the bottom opening in it;

(g) first means for swinging said swingably mounted press frame back and forth between an operative position in which hot isostatic pressing takes place and a transfer position which is spaced laterally of the central horizontal extension of said hot isostatic pressing vessel;

(h) at least one rail running between but beneath and spaced laterally from said swingably mounted press frame when it is in its operative position and beneath and laterally spaced from said plurality of auxiliary cylinders; and

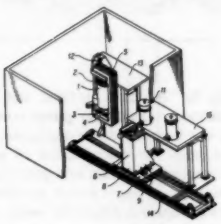
(i) a carrier movably mounted on said at least one rail for movement between said press frame and said plurality of auxiliary cylinders, said carrier comprising:

(i) a car which engages said at least one rail and which is laterally spaced from the central horizontal extension of said hot isostatic pressing vessel;

(ii) second means for driving said car reciprocally in either direction along said at least one rail;

(iii) a lift frame mounted on said car;

(iv) a bottom lid cradle cantileveredly mounted on said lift frame so as to extend laterally therefrom such that, when said carrier is positioned adjacent said press frame, said bottom lid cradle extends beneath the trans-



fer position of said press frame and, when said carrier is positioned adjacent one of said plurality of auxiliary cylinders, said bottom lid cradle extends beneath said one or said auxiliary cylinders; and

(v) third means for driving said bottom lid cradle reciprocally up and down on said lift frame beteween one or more upper transfer positions and a lower carrying position; whereby:

(j) when said press frame is located in its transfer position and said carrier is located adjacent to said press frame with said bottom lid cradle located in an upper transfer position, one of said detachable bottom lids and an object to be treated located on said one of said detachable bottom lids can be loaded into or removed from said hot isostatic pressing vessel;

(k) when said carrier is located adjacent to one of said plurality of auxiliary cylinders with said bottom lid cradle located in an upper transfer position, one of said detachable bottom lids and an object to be treated located on said one of said detachable bottom lids can be loaded into or removed from said one plurality of auxiliary cylinders; and

(l) an object to be treated located on one of said detachable bottom lids can be transferred back and forth between said hot isostatic pressing vessel and said plurality of auxiliary cylinders while said bottom lid cradle is in its lower carrying position and an object to be treated located thereon is beneath and out of the way of said hot isostatic pressing vessel and said plurality of auxiliary cylinders.

4,537,570

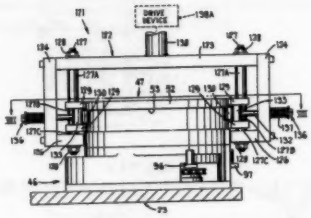
LIFTING APPARATUS FOR AN INJECTION MOLD

John W. Black, Hickory Corners; Richard D. Shupe, and Earl Simon, both of Kalamazoo, all of Mich., assignors to Pemco-Kalamazoo, Inc., Kalamazoo, Mich.

Division of Ser. No. 243,030, Mar. 12, 1981, Pat. No. 4,424,015. This application Oct. 20, 1983, Ser. No. 543,749

Int. Cl.[3] **B29F** *1/00*; **B29C** *3/00*

U.S. Cl. 425—450.1 **6 Claims**



1. A mold top lifting apparatus for lifting a mold top generally upwardly away from a position adjacent a mold bottom to a position spaced from said mold bottom, said mold top having generally vertical first and second side surfaces facing outwardly on opposite sides thereof and having means defining a downwardly facing lip at the top of each said side surface, comprising:

movable support means supporting said mold bottom and first drive means for effecting movement of said support means in a generally horizontal direction approximately perpendicular to the directions in which said side surfaces on said mold top face;

movable frame means and second drive means for effecting generally vertical movement of said frame means between a first position and a second position above said first position; and

first and second gripping means on said frame means which are spaced horizontally in a direction approximately perpendicular to said direction of movement of said support means, movement of said support means when said frame means is in said first position causing said mold top to move to a position in which said mold top is between said first and second gripping means and said first and second gripping means are respectively engaging said side surfaces thereon, and subsequent movement of said frame means from said first toward said second position thereof causing said mold top to be lifted upwardly away from said mold bottom due to engagement of said gripping means with said lips on said mold top;

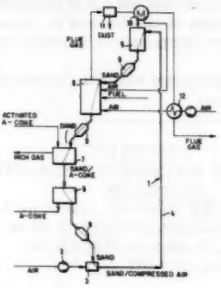
wherein said first and second gripping means respectively include first and second roller support members supported on said frame means for pivotal movement about respective substantially vertical pivot axes, wherein said first gripping means includes two first rollers supported on said first roller support member on opposite sides of said pivot axis thereof for rotation about respective substantially vertical axes, and wherein said second gripping means includes two second rollers supported on said second roller support member on opposite sides of said pivot axis thereof for rotation about respective substantially vertical axes, said mold top passing between said first and second roller support members as said support means moves and said first rollers and said second rollers respectively rolling firmly across said first and second side surfaces on said mold top just below said lips thereon.

4,537,571

PROCESS OF AND APPARATUS FOR REHEATING AND CONVEYING A GRANULAR HEAT CARRIER

Ludwig M. Buxel, Waltrop, and Ludwig Müllhaus, Iserlohn, both of Fed. Rep. of Germany, assignors to Uhde GmbH, Dortmund, Fed. Rep. of Germany

Filed Aug. 17, 1983, Ser. No. 524,090
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1982, 3230656
Int. Cl.[3] F27B *15/00*; F28C *3/10*
U.S. Cl. 432—27 22 Claims



1. Process of reheating and conveying a granular heat carrier, such as sand, using a gas where the heat carrier may be employed for desorption by heating a charged lumpy adsorbent, such as activated carbon pellets, comprising a vertically arranged cycle loop having a lower end and an upper end with the heat carrier located in the loop, introducing a carrier gas into the lower end of the loop with the carrier gas at a lower temperature than the heat carrier in the lower end of the loop and conveying the heat carrier by the lower temperature carrier gas in the upward direction from the lower end of the loop into a closed space located at the upper end of the loop, separating the heat carrier from the carrier gas in the closed space, flowing the separated heat carrier under the effect of gravity downwardly in the loop and during the gravity feed, in turn, heating the heat carrier, mixing the heated heat carrier and the adsorbent in a desorber, separating the heat carrier from the adsorbent and returning the heat carrier to the point at the lower end of the loop where the carrier gas is introduced for conveying the heat carrier.

4,537,572

ASSEMBLY FOR POSITIONING A THERMOGRAVIMETRIC FURNACE

Harold I. Hill, Fairfield, Conn.; Stanley D. Norem, Bayside, N.Y., and Roger Targowski, Fairfield, Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Feb. 2, 1984, Ser. No. 576,292
Int. Cl.[3] F27D *19/00, 15/02, 3/00*
U.S. Cl. 432—55 15 Claims

1. Apparatus for positioning two halves of a thermogravimetric furnace, said apparatus comprising, in combination:

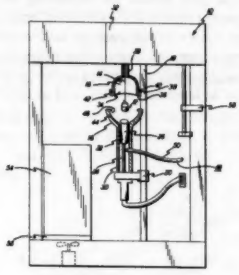
a first portion of a thermogravimetric furnace disposed at a fixed location;

a rotatable shaft;

means affixing a second portion of a thermogravimetric furnace such that said second portion rotates about the axis of said shaft when it rotates and said affixing means is longitudinally displaceable along said shaft;

moving means coupled to said affixing means to longitudinally displace said second portion relative to said shaft between a first position where said first portion and said second portion fit together to form an oven enclosure;

rotating means to rotate said shaft between two positions, the first position comprising a cooling position and the second position comprising an engaging position whereat said moving means may be actuated to cause said first and said second portion to fit together;



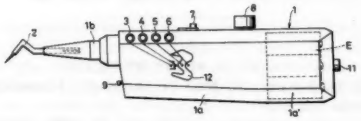
means for excluding simultaneous rotation of said shift and longitudinal displacement of said affixing means.

4,537,573

DETECTOR FOR DIAGNOSING DENTAL CARIES

Imao Sunada, Tokyo, Japan, assignor to Noburu Onuki, Tokyo, Japan

Filed Dec. 29, 1983, Ser. No. 566,808
Int. Cl.[3] A61C *3/00*
U.S. Cl. 433—32 4 Claims



1. A detector for diagnosing dental caries comprising:

a casing having thereon a plurality of indicating lamps, said casing being shaped so as to be easily grasped with one hand;

a tooth electrode attached to an end portion of said casing;

a second electrode;

a measuring circuit means within said casing and connected to said indicating lamps, tooth electrode, and second electrode, for determining said measuring the presence and progress of dental caries and indicating such progress in cooperation with said indicating lamps;

an adjusting means, provided on said casing and connected to said measuring circuit means, for setting a reference voltage for calibrating said measuring circuit means; and

a tooth pattern indicia provided on said casing and associated with said indicating lamps to enable one to visually observe the progress of dental caries.

4,537,574

DENTAL ARTICULATOR

Alan D. Clark, 810 Gardendale, Ferndale, Mich. 48220

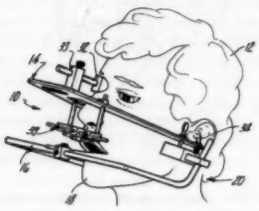
Filed Mar. 24, 1983, Ser. No. 478,243
Int. Cl.[3] A61C *19/04*
U.S. Cl. 433—69 14 Claims

11. An articulator for simulating occlusal displacement of a particular condylar structure, said displacement being recorded by at least one stylus, each of said at least one stylus being fixedly secured with respect to the maxillary structure of the head of a patient, receptacles corresponding in number to the number of styli, each receptacle being filled with impressionable material, fixed with respect to the mandibular structure of the patient and positioned so as to be in communication with one of said styli so that displacement of each said at least

one stylus records an impression by said stylus in said material, the articulator comprising;

an upper arm formed by a one-piece face bow having an anterior bar and means for receiving an incisal pin and spaced apart, rearwardly extending arms, means for supporting an upper dental cast on said upper arm,

a base having means for supporting a lower dental cast, and means for displaceably mounting said arm to said base comprising said at least one stylus, said at least one receptacle,



and means for supporting said at least one receptacle in registration with said at least one stylus, whereby said stylus rides in said impression and wherein said stylus and impression form the sole condylar guidance means for controlling displacement of said upper arm with respect to said base,

and wherein said means for supporting an upper dental cast comprises a bracket secured to and extending across said arms having means for mounting a dental cast.

4,537,575

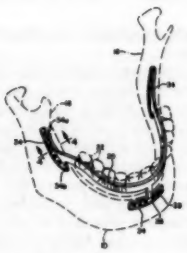
DENTURE SUPPORT FRAME

Harold D. Roberts, 202-1862 W. Broadway, Vancouver, BC, Canada V6J 1Y9

Continuation of Ser. No. 527,237, Aug. 29, 1983, abandoned. This application Dec. 19, 1984, Ser. No. 684,151

Int. Cl.³ A61C *8/00*

U.S. Cl. 433—176 **2 Claims**



1. A denture support frame arranged to be secured to the lower jaw of a person for supporting an artificaial denture thereon, said frame comprising

a one-piece U-shaped bar having upper and lower edges and arranged to support an artificial denture on its upper edge, said bar having front and rear portions with the front being narrowed and curved and the rearwardly extending portions at the sides diverging outwardly in substantially a straight line whereby to be of a contour similar to the contour of the lower jaw of a person,

a rear ramus implant portion on each side at the rear portion arranged to be implanted in recesses cut in the ramus portion of the jaw bone,

and front support means on said bar arranged for engagement with the jaw,

said ramus implant portions comprising rear longitudinal extensions of said bar,

said extensions having substantially the same vertical disposition as the rear portion of said bar from which it extends,

said extensions being joined with said bar at an angle substantially greater than a right angle but less than 180 degrees and extending both upwardly and downwardly relative to rear portions of the bar with the upward extending portion having a length substantially greater than the downward extending portion,

said rear portions of said bar immediately forward of said ramus implant extensions being bent upward a small amount whereby to be disposed out of alignment with the straight side portions of said bar and to extend into the ramus jaw portions approximately centrally between the sides,

said extensions being directed from front to rear toward said front support means.

4,537,576

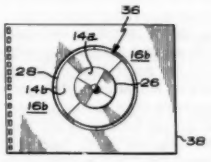
EDUCATIONAL BOOK WITH INTERACTIVE ELEMENTS

Howard I. Thorsheim, 314 Oxford St., and Bruce B. Roberts, 415 Ivanhoe Ave. West, both of Northfield, Minn. 55057

Filed Jul. 16, 1984, Ser. No. 631,162

Int. Cl.³ G09B *1/22*

U.S. Cl. 434—404 **15 Claims**



1. An educational book providing interaction between graphic information contained on reference elements with graphic information contained on apertured leaves, said book comprising:

a base leaf;

a plurality of reference elements of varying size, each containing graphic information, the reference elements being rotatably mounted on the base leaf in succession, each reference element being smaller than the reference element behind it;

a plurality of apertured leaves containing a second set of graphic information juxtaposed with respect to the apertures, said leaves in register with and overlying the base leaf with the apertures visually aligned with the reference elements, the reference elements being rotatable with respect to each other and the leaves; and

binding means binding said apertured leaves and base leaf together at one end.

4,537,577

TOY VEHICLE AND TRACK ASSEMBLY

Terry Sansome, 13176 Jasper Pl., Windsor, Ontario, Canada N8N3K4, and Thomas L. Simmel, 44 Booras La., Milford, Conn. 06460

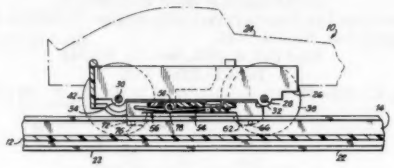
Filed Jan. 27, 1984, Ser. No. 574,569

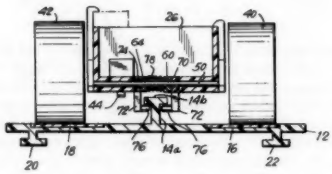
Int. Cl.³ A63H *18/14*

U.S. Cl. 446—445 **19 Claims**

1. Apparatus including in combination a vehicle formed with a plurality of wheels and a motor adapted to drive said wheels upon actuation, a track along which said vehicle travels, said track formed with a guide extending the length of said track, a first clip mounted for pivotal movement to the underside of said vehicle, said first clip adapted to engage said guide, a

second clip mounted for pivotal movement to the underside of said vehicle, said second clip adapted to engage said guide, said first and second clips cooperating to guide said vehicle along said track and positioned on said vehicle so as to maintain said





vehicle moving on said track by pivoting said vehicle with respect to said track such that one end of said vehicle is urged towards said track and at least one of said wheels is always in driving contact with the track.

4,537,578

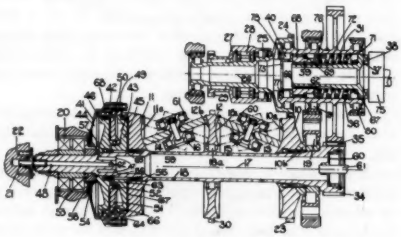
COUPLINGS

Raymond Sharpe, Mirfield; Trevor J. Griffiths, Bradford, and Peter Hunt, Shipley, all of England, assignors to Lucas Industries Limited, England

Continuation-in-part of Ser. No. 824,248, Aug. 12, 1977, abandoned. This application Jan. 3, 1980, Ser. No. 109,225

Int. Cl.³ F16D *11/00*

U.S. Cl. 464—31 **7 Claims**



1. A coupling for two coaxial rotary members, axially interengaging teeth on said members arranged for driving engagement between said members, one of said members being connected to a further part rotatable therewith, helical splines by means of which said member and said further part are directly or indirectly connected, the helical splines, during rotation of the members in one direction, applying an axial force between said one member and said further part tending to disengage said teeth, an element sensitive to temperature rise arranged to resist the tendency for axial relative movement between said one member and said further part, said element being arranged to melt when the temperature is in excess of a predetermined value, resulting in said one member being allowed to move axially relatively to said further part under the influence of said force, to disengage the teeth, bearings for rotationally supporting said one member and being substantially free from axial loading due to said force, and spring means to hold the teeth out of engagement after the temperature sensitive element has melted.

4,537,579

TORSIONAL DAMPER DEVICE

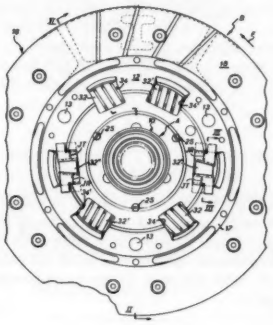
Pierre Loizeau, Ville d'Avray, France, assignor to Valeo, Paris, France

Filed Sep. 7, 1983, Ser. No. 530,042

Claims priority, application France, Sep. 7, 1982, 82 15176

Int. Cl.³ F16D *3/14, 13/68*

U.S. Cl. 464—68 **15 Claims**



1. A torsional damper device in particular for a clutch plate comprising at least two coaxial parts mounted to rotate relative to each other within defined limits of relative angular movement, a transversely extending flange on one of said coaxial parts, two transversely extending guide rings on the other of said coaxial parts, said guide rings being spaced from and attached to each other and disposed one on each side of said flange, circumferentially acting elastic means disposed between and adapted to act circumferentially on said coaxial parts so as to resist said relative angular movement, apertures in said guide rings and flange for housing said elastic means, said elastic means comprising at least one elastic member, a bearing member circumferentially and operatively disposed between said elastic member and said guide rings, said bearing member having two transverse arms extending perpendicularly to the axis of said device and circumferentially overlying the respective guide rings, said arms being axially spaced from and out of contact with said flange, constant frictional contact being provided between said arms and the respective guide rings, whereby frictional torque is produced between said arms and guide rings in the course of relative angular movement therebetween.

4,537,580

TORSIONAL DAMPER DEVICE

Pierre Loizeau, Ville D'Avray, and André Caray, Valence, both of, assignors to Valeo, Paris, France

Filed Sep. 6, 1983, Ser. No. 529,741

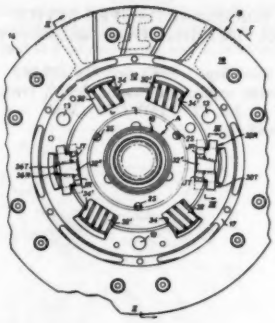
Claims priority, application France, Sep. 7, 1982, 82 15175

Int. Cl.³ F16D *3/14, 13/68*

U.S. Cl. 464—68 **23 Claims**

1. A torsional damper device comprising at least two coaxial parts disposed to rotate relative to one another within defined limits of relative angular movement, one of said parts having a transversely disposed flange and the other of said parts having a transversely disposed guide ring, circumferentially acting elastic means disposed between said parts for acting circumferentially on said parts so as to resist said relative angular movement between said parts, said elastic means including a plural-

ity of individual elastic members, holes in said flange, holes in said guide ring, said holes in said flange and said guide ring together forming housings in which respective ones of said elastic members are disposed, a chock through which at least one of said elastic members bears on the edge of the respective



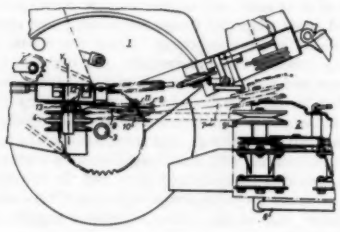
hole in said guide ring, and a recess in said chock disposed in line with said flange, said recess defining means permitting angular movement of said flange relative to said guide ring in the circumferential direction beyond the point of contact of said chock with the edge of the corresponding hole in said guide ring.

4,537,581

CONE BELT TIGHTENING DEVICE

Sören Johansson, Tranås; Roger Andersson, Grinna, and Lennart Jonsson, Österbymo, all of Sweden, assignors to Stiga AB, Tranas, Sweden

Filed Apr. 18, 1983, Ser. No. 485,996
Claims priority, application Sweden, Apr. 30, 1982, 8202729
Int. Cl.³ F16H 7/22
U.S. Cl. 474—123 **4 Claims**



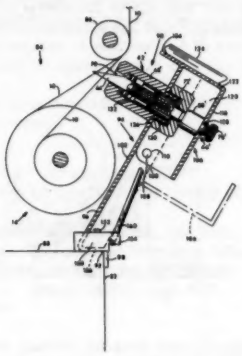
1. A tightening device for cone belts and the like for use in cone belt transmissions, including at least one preferably driven cone belt pulley (5) which is axially or substantially axially displaceable relative to at least one other, preferably driving cone belt pulley (4) mounted on a shaft, and a cone belt (7) interconnecting said cone belt pulleys, said tightening device engaging one run of the cone belt by means of a rotary member, wherein the tightening means includes a preferably spring-loaded support lever (8) arranged adjacent one (4) of the cone belt pulleys and adapted to pivot about a first axis (Y) situated substantially parallel with the cone belt pulley shaft and also about a second axis (X), said second axis being located between said pulleys (4, 5) and being generally perpendicular to said first axis (Y), and a tightening pulley (10) preferably provided with a cone belt groove is fitted at a free end of said support lever (8) in order to maintain the engagement of the tightening pulley (10) independently of any displacement of the cone belt runs (7', 7'') caused by the relative displacement of the cone belt pulleys (4, 5).

4,537,582

PLOTTER PAPER SLITTER

Dean-Yuan Liu, Canoga Park, Calif., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Oct. 4, 1983, Ser. No. 538,864
Int. Cl.³ B26D 3/08
U.S. Cl. 493—38 **10 Claims**



1. In a strip media system wherein a strip media is moved from a supply roller through a work area and onto a takeup roller mounted to a frame, apparatus for longitudinally slitting the strip of media comprising:

(a) a housing adapted to be releasably attached to the frame and including a plate member having a surface in parallel, spaced relationship to the strip media, said surface having an opening therethrough for the passage of a cutting blade;

(b) a cutter assembly retractably mounted to said plate member and having a cutting blade aligned with said opening said cutter assembly being adapted to be moved between an extended position with said blade extending through said opening to contact the strip media to slit it and a retracted position with said blade retracted back through said opening and not being exposed on said surface wherein it is in a safety position protected from being contacted by a system operator;

(c) a latching mechanism having unlocked and locked positions for releasably securing said housing to the frame; and,

(d) safety actuator means connected between said latching mechanism and said cutter assembly for moving said cutter assembly to said extended position when said latching mechanism is in said locked position and for moving said cutter assembly to said retracted position when said latching mechanism is in said unlocked position whereby when said apparatus is removed from the system, said blade is automatically moved to said safety position, the improvement wherein:

(e) said housing has a releasably latchable opening portion moveable between open and closed positions;

(f) said cutter assembly is disposed within said housing;

(g) said safety actuator means is connected to said opening portion: and,

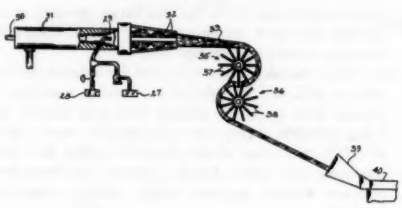
(h) said latching mechanism is operated by said opening portion whereby when said opening portion is moved to said open position said latching mechanism is in said unlocked position and when said opening portion is moved to said closed position said latching mechanism is in said locked position.

4,537,583

METHOD AND APPARATUS FOR CONVEYING FILTER TOW

James W. Pryor, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Feb. 18, 1983, Ser. No. 468,012
Int. Cl.³ B31C *13/00*
U.S. Cl. 493—42 **9 Claims**



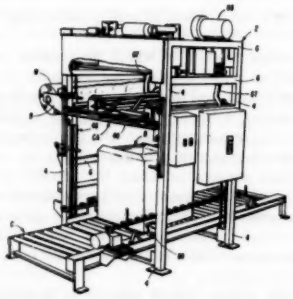
1. Apparatus for withdrawing a bloomed, continuous multifilament filter tow from a jet device and conveying the bloomed filter tow to filter rod-forming means, said apparatus including at least two rotatable, cooperating rolls with each roll comprising a shaft provided with a plurality of tow-contacting members projecting radially outwardly from the longitudinal axis of the shaft and spaced circumferentially around the periphery of the shaft with the tow-contacting members of at least one of the rolls being provided with recessed areas for engaging the filter tow, means for rotating at least one of the rolls and means for maintaining the cooperating rolls in parallel, aligned juxtaposition that is close enough to engage and advance the filter tow introduced between the rolls without significantly compressing the filter tow between directly opposed tow-contacting members.

4,537,584

METHOD AND APPARATUS FOR FORMING PLASTIC LINERS AND INSERTING THEM INTO BULK CONTAINERS

Wayne F. Everman; D. Michael Lewis, and Raymond L. Russell, all of Cedar Falls, Iowa, assignors to Container Corporation of America, Chicago, Ill.

Filed Dec. 19, 1983, Ser. No. 563,290
Int. Cl.³ B31B *7/00*
U.S. Cl. 493—93 **9 Claims**



1. Apparatus for forming, from continuous plastic sleeve material, an inverted plastic liner bag, closed at the top and open at the bottom, and inserting it into an open top container, comprising the combination of:

(a) a frame structure;

(b) a carriage assembly mounted for vertical movement on said frame structure;

(c) dispensing means mounted on an upper portion of said frame structure for engaging and moving downwardly a continuous web of plastic sleeve material past cutting and sealing means toward said carriage, said dispensing means being operable to feed the continuous web a predetermined length with the downwardly leading end of the web adjacent the carriage assembly;

(d) cutting and sealing means mounted on said frame structure for cutting from said web said predetermined length of plastic sleeve material and for sealing an upper end of said length to form an inverted bag;

(e) said carriage assembly including a pair of laterally movable inserting means for grasping and spreading open the downwardly leading end of said inverted bag and drawing it over an upper open end of said container to form a cuff while the remaining sealed end of the bag is free to fall by gravity into said container;

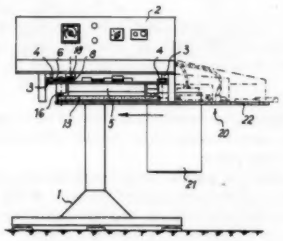
(f) bag positioning means for covering the upper open end of the container and forcing air into the bag to urge said bag against the inner surfaces of the container.

4,537,585

CONTINUOUS HEAT SEALER FOR SACKS AND BAGS IN THERMOPLASTIC MATERIAL

Rodric H. Norman, 19,Chemin du Blanc Caillou, B-1420 Braine-L'Alleud, Belgium

Filed Apr. 27, 1982, Ser. No. 372,444
Claims priority, application Luxembourg, Apr. 28, 1981, 83326
Int. Cl.³ B31B *1/64*
U.S. Cl. 493—205 **12 Claims**



1. An apparatus for heat sealing together confronting side walls of thermoplastic bags as the bags pass through the apparatus, said apparatus comprising a main assembly including drive and control means for the apparatus, and a heat sealing head having confronting heat transfer means between and in contact with which the bags pass such that confronting sidewalls thereof are heat sealed together, said heat sealing head constituting a sub-assembly which is provided with its own drive means and which is removably fitable to said main-assembly with a single drive connection between the drive means of the main and sub-assemblies to allow replacement of the heat sealing head sub-assembly by another said heat sealing head sub-assembly.

4,537,586

METHOD AND APPARATUS FOR APPLYING COUPON STRIPS TO PAPER BAGS

Ronald S. Gale, Beaverton; William E. Bristol, Hillsboro, and Carroll Noonan, Beaverton, all of Oreg., assignors to Willamette Industries, Inc., Beaverton, Oreg.

Filed Feb. 21, 1984, Ser. No. 581,547
Int. Cl.³ B31B *1/90, 37/74*
U.S. Cl. 493—220 **2 Claims**

1. A method of applying a coupon strip to the inside of the front panel of a four-sided self-opening paper grocery bag having a front panel, a back panel, inwardly-folded opposite

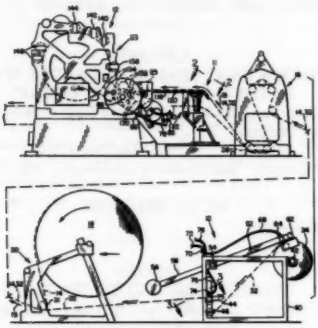
side panels joining the front and back panels, and a bottom panel closing the front, back and side panels, comprising:

conveying a continuous web of bag paper in the longitudinal direction thereof;

providing a continuous strip of coupons, the width of the strip being sized to a width less than the spacing between the inwardly-folded side panels of the bag when the bag is folded flat;

perforating the strip of coupons along a margin thereof, thus defining a margin portion and a detachable coupon portion, the width of the strip being further sized so that at least the detachable coupon portion is not overlapped by the ends of the side panels when the side panels are folded inwardly to form the bottom panel for the bag;

conveying the continuous strip of coupons longitudinally of the web of bag paper along one side thereof at a position spaced centrally of the longitudinal margins of the web of bag paper;



applying glue longitudinally solely to the margin portion of the strip of coupons on the side of the strip facing the web of bag paper;

pressing the margin portion and the coupon portion of the strip of coupons against the web of bag paper to adhere the margin portion to said one side of the web of bag paper prior to forming the web into a tube;

after adhering the margin portion of the strip of coupons to said one side of the web, continuously turning longitudinal margins of the web of bag paper with the strip of coupons adhered thereto toward said one side of the web to form the web into a tube and enclose the strip of coupons therein;

periodically cutting a portion of the web transversely to define a top of a first bag and a bottom of a second bag and to cut the strip of coupons into an elongated segment;

folding portions of the longitudinal margins of the bag inwardly to form inwardly-folded side panels of the bag; and

folding the bottom of the bag to close the same.

4,537,587

CARTON OPENING MECHANISM

Marinus J. M. Langen, Rexdale, Canada, assignor to H. J. Langen & Sons Limited, Mississauga, Canada

Filed Aug. 9, 1983, Ser. No. 521,576

Int. Cl.[3] **B31B** *1/78, 1/80*

U.S. Cl. 493—315 **3 Claims**

1. A carton opening mechanism for use in opening a knocked-down carton and transferring the open carton to a receiver having a receiver compartment proportioned to receive an open carton, said receiver compartment having an entranceway opening therefrom, comprising;

(a) a carton storage means having a discharge opening through which knocked-down cartons may be withdrawn one at a time,

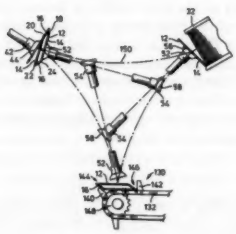
(b) carton opening means having a first suction face,

(c) said discharge opening and first suction face being circumferentially spaced 120 degrees from one another about the perimeter of a circle and facing inwardly toward a central axis located at the center of said circle,

(d) said carton opening mechanism being mounted so as to locate the receiver compartment on the perimeter of said circle equidistant from the discharge opening and first suction face with the entranceway of said compartment opening toward said central axis,

(e) a rotary transfer means mounted for rotation about said central axis, said transfer means having a suction head formed with a transfer suction face, said transfer means being operable, in response to continuous rotation thereof, to effect movement of said transfer suction face along a triangular path which has first, second and third shallow concave arcuate portions which extend, respectively, between,

(i) a first position in which the transfer suction face is located at a first apex of said triangular path and is directed toward said discharge opening and positioned to engage a



wall of a carton blank located in the storage means in use, and

(ii) a second position in which the transfer suction face is located at a first apex of said triangular path and is directed toward and disposed opposite the first suction face of said carton opening means to press an opposite wall of the carton into engagement with the first suction face, and between said second position and,

(iii) a third position in which the transfer suction face is located at a first apex of said triangular path and is directed toward and disposed adjacent the entranceway of the receiver to deposit an open carton in said receiver compartment in use, and between said third position and said first position,

(f) suction control means adapted to generate a negative pressure at said transfer suction face when it is in said first position and during movement of said transfer suction face between said first, second and third positions so as to secure a wall of a knocked-down carton thereto, withdraw it from the storage means, transported to and open it by engagement with the opening means and deposit the open carton in the receiver compartment and thereafter to relieve the negative pressure to release the open carton.

4,537,588

PUNCH DEVICE FOR MAKING WINDOW CUT-OUTS

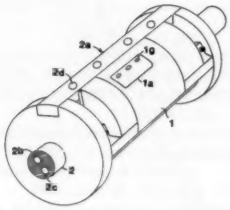
Gunter Ehlscheid, Neuwied, and Heinz-Helmut Frost, Puderbach, both of Fed. Rep. of Germany, assignors to Winkler & Dunnerbier Maschinenfabrik und Eisengiesserei GmbH & Co. KG., Neuwied, Fed. Rep. of Germany

Filed Jan. 16, 1984, Ser. No. 570,872

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1983, 3302038

Int. Cl.³ B31B *1/24*

U.S. Cl. 493—342 **1 Claim**



1. A rotating punch device for making window cut-outs in envelope blanks and cardboard box blanks comprising:

(a) a punch roller;

(b) a metal foil disposed on said punch roller having a cutting edge in the shape of the window cut-out thereon, said metal foil having leading and trailing bent ends, one of said bent ends having a U-shaped cut-out therein;

(c) a retaining segment on said punch roller for engaging said bent end of said metal foil having the U-shaped cut-put therein, said segment including a pin disposed therein for engagement with said U-shaped cut-out to thereby accurately register said metal foil on said punch roller;

(d) a clamping segment on said punch roller for engaging the other bent end of said metal foil and clamping said metal foil onto said punch roller;

(e) a stationary cutting bar which cooperates with the cutting edge of said metal foil to form said window cut-out;

(f) a transport segment carried by said punch roller which grips the leading edge of said blank and transports said blank;

(g) vacuum openings disposed in said transport segment for the purpose of gripping the leading edge of said blank to be cut so that said blank can be conveyed and retained on said punch roller; and

(h) vacuum openings within the cutting edge of said metal foil which are alternately subjected to vacuum and an air blast so as to control the discharge of the cut-out material.

4,537,589

APPARATUS FOR REMOVING THE WASTE EDGE PIECES FROM PUNCHED BLANKS

Heinrich Schmidt, Porta Westfalica, Fed. Rep. of Germany, assignor to Heinrich Greve GmbH, Lubbecke, Fed. Rep. of Germany

Filed Nov. 5, 1982, Ser. No. 439,640

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1981, 3144125

Int. Cl.³ B31B *49/00*

U.S. Cl. 493—373 **13 Claims**

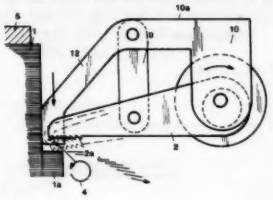
1. Apparatus for removing at least partly severed waste edges from sheet material which has been stacked comprising:

movable frame means;

at least a first parting element, said first parting element comprising an elongated arm having serrations in a first side edge adjacent a first end thereof;

means supporting said first parting element from said frame means; and

means for imparting orbital movement to said first parting element first end whereby said serrated edge will contact and penetrate the waste edge of a sheet of material and then pull said waste edge outwardly with respect to the stack of sheets, said frame means being at least in part



movable relative to said stack of sheets to cause said first parting element first end to consecutively engage a waste edge of adjacent sheets comprising the stack of sheets.

4,537,590

SUPERTHIN ABSORBENT PRODUCT

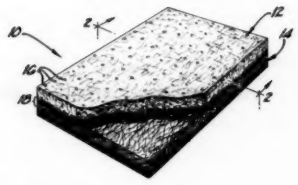
Heinz A. Pieniak, North Brunswick, and Michael J. Iskra, Flemington, both of N.J., assignors to Personal Products Company, Milltown, N.J.

Continuation-in-part of Ser. No. 439,963, Nov. 8, 1982, Pat. No. 4,500,315. This application Jun. 20, 1983, Ser. No. 505,579

The portion of the term of this patent subsequent to Feb. 19, 2005, has been disclaimed.

Int. Cl.³ A61F *13/00*

U.S. Cl. 604—379 **34 Claims**



1. An absorbent compressed composite laminate comprising a first layer, a second layer, and a transition zone integrally and intimately connecting said first and second layers and being substantially coextensive therewith, said first layer comprising a fibrous web having a dry bulk recovery of at least about 30 percent, an initial dry bulk of at least about 20 cc/gm, and a weight less than about 2 oz/yd^2, and a plurality of particles or globules of superabsorbent material disposed intermittently throughout said first layer, said particles or globules being present in at least about 200 percent dry-add-on basis, said second layer comprising substantially uniformly disposed, frictionally engaged hydrophilic particles selected from the group consisting of cellulosic fibers, peat moss, rayon fibers and mixtures thereof, said particles being sufficiently closely spaced to adjacent particles to promote rapid movement of liquid along the plane of said layer, and said transition zone comprising portions of said engaged particles extending into and becoming integral with said first layer with portions of said engaged particles in intimate contact with said superabsorbent material, said composite laminate being compressed to substantially reduce its thickness.

4,537,591

ADJUSTABLE DIAPER WITH A BACKBAND AND FASTENING PROTECTION MEANS

Fredrica V. Coates, 1608 Dublin Rd., Charlottesville, Va. 22903

Continuation-in-part of Ser. No. 315,049, Oct. 26, 1981,. This application May 5, 1982, Ser. No. 375,231

Int. Cl.[3] **A61F** *13/16*

U.S. Cl. 604—391 **23 Claims**

1. A diaper, comprising:

(a) a substantially rectangular piece of absorbent washable fabric having opposite inner and outer surfaces, said inner surface positionable to contact a wearer's skin to be diapered;

(b) a pair of attachment tabs attached to an upper edge portion of the fabric, each tab carrying a plurality of resiliently deformable, hook-like projections projecting outward from a surface of the tab;

(c) fastening means secured to the outer surface of the fabric, adjacent a lower transverse edge thereof for engaging the attachment tabs to secure the diaper of the wearer, said fastening means having a surface carrying a plurality of resiliently deformable, loop-like projections for engagement with the tab surfaces; and

(d) self-closing protective cover means carrying loop-like projections one edge of each tab and one end of its cover means being joined such that the surface areas of the tab and cover means are maintained face to face, in juxtaposition and coextensive and thereby tend to self-close, insulating the hook-like projections of the tabs from lint, during diaper cleaning.

4,537,592

Patent Not Issued For This Number

4,537,593

SELF-VENTING, NON-CORING NEEDLE ASSEMBLY

Paul G. Alchas, Montclair, N.J., assignor to Becton, Dickinson and Co., Paramus, N.J.

Filed Jun. 6, 1983, Ser. No. 501,303

Int. Cl.[3] **A61M** *5/00*

U.S. Cl. 604—411 **20 Claims**

1. A self-venting, non-coring needle assembly for the transfer of liquid to or from a container having a needle penetrable stopper thereon comprising:

a rigid hub having a forward end, a rearward end adapted to engage external fluid transfer apparatus and a passageway therethrough;

a cannula extending outwardly from said forward end and terminating in a closed distal end means for penetrating said stopper, said cannula having a lumen in fluid communication with said passageway, said cannula having an aperture in the side thereof adjacent to said distal end and in fluid communication with said lumen;

a sleeve member slidably engaged on said cannula and being shorter in length than the distance between said aperture and said forward end of said hub, said sleeve member adapted to enter the hole in the needle penetrable stopper made by said distal end means;

venting means for allowing gas to pass between the outside of said cannula and the inside of said sleeve; and

retention means for preventing said sleeve from sliding off said cannula.

4,537,594

PROCESSED FEATHERS

Charles R. W. Fleet, and Vincent K. Hewinson, both of Boston, England, assignors to Fogarty P.L.C., Lincolnshire, England

Filed Jul. 13, 1984, Ser. No. 630,763

Claims priority, application United Kingdom, Jul. 22, 1983, 8319816; Nov. 4, 1983, 8329538

Int. Cl.[3] D06M *19/00*

U.S. Cl. 8—94.1 R 9 Claims

1. Feathers having thereon a water-repellent, bacterial-resistant, low friction cured fluoroalkyl acrylate copolymer finish.

4,537,595

ORGANOPOLYSILOXANES WITH BUNTE SALT GROUPS, THEIR SYNTHESIS AND USE FOR THE SURFACE TREATMENT OF INORGANIC OR ORGANIC MATERIALS

Burghard Grüning; Ulrich Holtschmidt, and Götz Koerner, all of Essen, Fed. Rep. of Germany, assignors to TH. Goldschmidt AG, Essen, Fed. Rep. of Germany

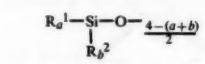
Filed Jun. 28, 1984, Ser. No. 625,711

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1983, 3323881

Int. Cl.[3] D06M *3/06, 13/26;* C07F *7/08;* D21F *11/14*

U.S. Cl. 8—115.6 15 Claims

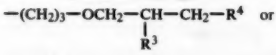
1. Organopolysiloxanes with Bunte salt groups attached having the formula:



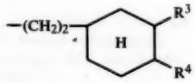
the Bunte salt groups being linked to a silicon atom by a carbon atom wherein

R^1 is methyl with the proviso that up to 10% of the R^1 groups may be alkyl with up to 18 carbon atoms, vinyl phenyl, hydrogen or hydroxyl,

R^2 is



or



in which one of the R^3 and R^4 is OH and the other —S-$_2O_3Me$ wherein Me is alkali, ammonium, or substituted ammonium, providing that in an amount up to 50% of the R^2 groups, R^3 and R^4 taken together can be OH or the oxygen atom of an oxirane ring,

a is from 1 to 2.33 and

b is from 0.02 to 1.

4,537,596

POLYETHERESTERS, THEIR PREPARATION, AND THEIR USE FOR TREATING TEXTILES

Hanns P. Müller, Odenthal, and Karl Schäfer, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 14, 1984, Ser. No. 651,003

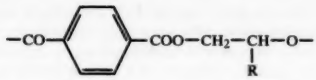
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1983, 3334798

Int. Cl.[3] D06M *9/00;* C08G *63/66*

U.S. Cl. 8—115.6 8 Claims

1. Water-soluble or water-dispersible segmented polyetheresters having a predominantly linear molecular structure and containing

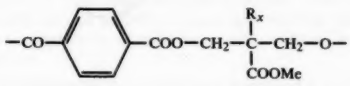
(a) 3–45% by weight of terephthalate groups of the formula



wherein

R denotes hydrogen or methyl,

(b) 0.4–6% by weight of terephthalate groups of the formula



wherein

R_x denotes hydrogen or C_1–C_4-alkyl and

Me denotes an alkali metal or ammonium ion, and

(c) 49–96.6% by weight of terminal polyalkylene glycol groups, all the weights being relative to that of the polyetherester.

4,537,597

NAVY BLUE MIXTURES OF DISPERSE MONO-AZO DYES FOR CELLULOSE ACETATE

Udo Bergmann, Darmstadt; Helmut Degen, Frankenthal; Guenter Hansen, Ludwigshafen; Reinhold Krallmann, Weisenheim, and Hans Weber, Hassloch, all of Fed. Rep. of Germany, assignors to Basf Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

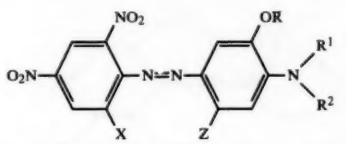
Filed May 17, 1984, Ser. No. 611,536

Claims priority, application Fed. Rep. of Germany, May 20, 1983, 3318451

Int. Cl.[3] C09B *29/08, 67/22;* D06P *1/04*

U.S. Cl. 8—639 5 Claims

1. A dye mixture which contains at least two different dyes of the formula



wherein

X is chlorine or bromine,

Z is methyl, methoxy, ethoxy or acetylamino,

R is methyl or ethyl and

R^1 and R^2 independently of one another are hydroxyethyl, hydroxypropyl, acetoxyethyl, acetoxypropyl, propionyloxyethyl or propionyloxypropyl.

4,537,598

PROCESS FOR TRICHROMATIC DYEING OR PRINTING OF POLYAMIDE

Harry Schaetzer, Wehr, Fed. Rep. of Germany; Helmut Raisin, Riehen, and Dieter Mäusezahl, Biel-Benken, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

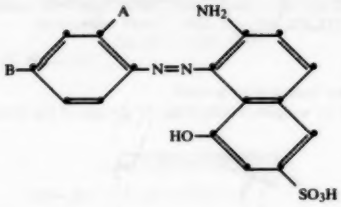
Filed May 24, 1984, Ser. No. 614,222

Claims priority, application Switzerland, May 25, 1983, 2838/83

Int. Cl.[3] C09B *67/22;* D06P *3/06*

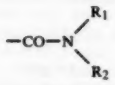
U.S. Cl. 8—641 18 Claims

1. A process for dyeing or printing natural and synthetic polyamide material by the trichromatic technique, which comprises the use of a red dye of the formula

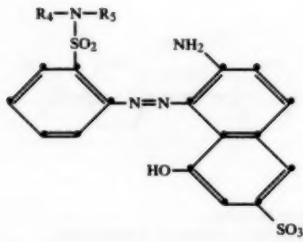


(1)

wherein A is hydrogen, unsubstituted or substituted C_1–C_4alkyl,

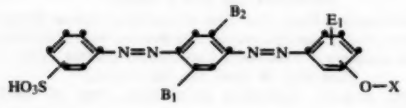


or $—SO_2R_3$, wherein R_1 is C_1–C_4alkyl, R_2 is unsubstituted or substituted C_5–C_7cycloalkyl or unsubstituted or substituted phenyl, and R_3 is unsubstituted or substituted phenyl or unsubstituted or substituted phenoxy, and B is hydrogen, C_2–C_4alkanoylamino, C_5–C_8cycloalkoxycarbonylamino, C_1–C_4alkoxycarbonylamino, C_1–C_4alkylsulfonylamino or unsubstituted or substituted phenylsulfonylamino, or a mixture of the red dye of the formula (1) with a red dye of the formula



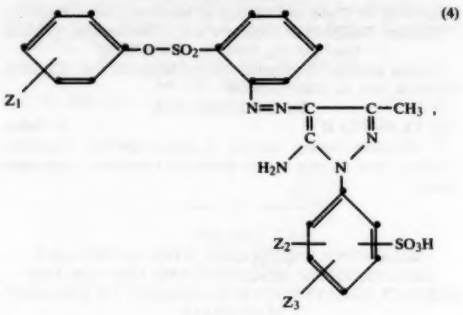
(2)

wherein R_4 is methyl or ethyl and R_5 is cyclohexyl or phenyl, together with at least one yellow or orange dye of the formula



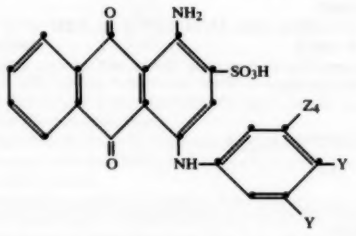
(3)

wherein B_1, B_2 and E_1 are hydrogen, C_1–C_4alkyl or C_1–C_4alkoxy, and X is straight chain or branched C_1–C_4alkyl or straight chain or branched C_2–C_4hydroxyalkyl, or a mixture of at least one yellow or orange dye of the formula (3) with a yellow dye of the formula



(4)

wherein Z_1, Z_2 and Z_3 are each independently hydrogen, halogen, C_1–C_4alkyl or C_1–C_4alkoxy, and at least one blue dye of the formula



(5)

wherein one Y is hydrogen or methyl and the other Y is C_2–C_4alkanoylamino or C_2–C_4hydroxyalkylsulfamoyl and Z_4 is hydrogen or methyl.

4,537,599

PROCESS FOR REMOVING SULFUR AND ASH FROM COAL

Edward H. Greenwald, Sr., 92 Nancy La., McMurray, Pa. 15317

Continuation-in-part of Ser. No. 489,568, Apr. 28, 1983, abandoned. This application Apr. 16, 1984, Ser. No. 598,979

Int. Cl.[3] **C10L** *9/02*

U.S. Cl. 44—1 SR **32 Claims**

1. A process for removing clay and pyrite from coal comprising:

forming a slurry of coal particles from a coal-feed stream contaminated with clay and pyrite, the coal particles having a desired mesh size,

adjusting the pH of the slurry to maintain a colloidal dispersion wherein clay and pyrite particles are a colloid,

forming a colloidal dispersion of clay and pyrite particles by agitating the slurry of coal particles to release clay and pyrite from the surface of the coal particles,

recovering a slurry of coal particles having a size greater than 2 microns,

adjusting the pH of the recovered slurry of coal particles to maintain a colloidal dispersion wherein clay and pyrite particles are a colloid,

again forming a colloidal dispersion of clay and pyrite particles by releasing additional clay and pyrite from the surface of the coal particles, and

recovering coal particles greater than 2 microns.

12. The method according to claim **1** wherein said step of recovering coal particles includes separating coal particles from the slurry in a centrifuge.

4,537,600
METHOD FOR THE PREPARATION OF PITCH-IN-WATER SLURRY

Hiroto Tajima, Yokohama; Hironori Kawakami, Kawasaki; Zenichi Mashino, Soka; Seinoshin Hayami, Yokohama, and Osamu Ohzeki, Fukui, all of Japan, assignors to Chiyoda Chem. Engineering & Constr. Co., Yokohama and Nikka Chemical Industry Co., Ltd., Fukui, both of, Japan

Filed Mar. 27, 1984, Ser. No. 593,827
Claims priority, application Japan, Mar. 30, 1983, 58-54847
Int. Cl.³ C10L *1/30*
U.S. Cl. 44—51 17 Claims

1. A method of preparing a pitch-in-water slurry, comprising the steps of:

mechanically molten pitch in the presence of water to obtain coarse pitch particles solidified during the comminution by contact with the water, and

finely pulverizing the coarse pitch particles in the presence of water to form a slurry containing the finely pulverized pitch particles dispersed in the water.

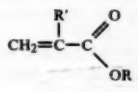
4,537,601
ANTISTATS CONTAINING ACRYLONITRILE COPOLYMERS AND POLYAMINES

Michael I. Naiman, St. Louis, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

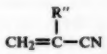
Division of Ser. No. 378,541, May 17, 1982, Pat. No. 4,491,651. This application Oct. 29, 1984, Ser. No. 634,251
Int. Cl.³ C10L *10/00*
U.S. Cl. 44—62 12 Claims

1. A hydrocarbon fuel containing an effective antistatic amount of composition comprising

(1) a copolymer of (a) a monomer of the formula



and (b) a monomer of the formula



Where R′ and R″, which may be the same or different, are hydrogen or an alkyl group and R is selected from the group consisting of alkyl, cycloalkyl, aryl and alkaryl, the molar ratio of (b) to (a) being from about 10:1 to 1:10, and the molecular weight of the copolymer being at least about 1000; and

(2) a polymeric polyamine selected from the group consisting of (i) the reaction product of an epihalohydrin and an amine and (ii) an α-olefin-maleimide copolymer.

4,537,602
ADDITIVE CONCENTRATES FOR DISTILLATE FUELS

Albert Rossi, Warren, N.J., and Kenneth Lewtas, Wantage, England, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Sep. 15, 1983, Ser. No. 532,319
Claims priority, application United Kingdom, Sep. 16, 1982, 82-26430
Int. Cl.³ C10L *1/24*
U.S. Cl. 44—62 20 Claims

1. An additive concentrate for incorporation into wax containing petroleum fuel oil compositions to improve low temperature flow properties of said oil comprising an oil solution containing

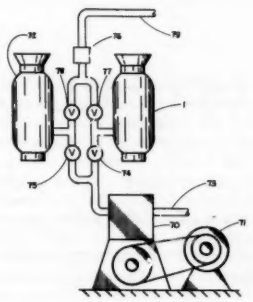
(a) In the range of 3% to 90 wt. % based on a total weight of the concentrate of a C_{30}–C_{300} oil-soluble nitrogen compound wax crystal growth inhibitor having at least one straight C_8–C_{40} alkyl chain and being selected from the class consisting of ammonium salts, amine salts and amides of aromatic or cycloaliphatic dicarboxylic acids or anhydrides thereof having 5 to 13 carbon atoms in their cyclic moiety, and mono esters of said acids or anhydrides, said nitrogen compound being formed by reaction of about one to two moles of amine per mole of acid, anhydride or ester; and

(b) one to three moles per mole of (a) of an organic acid capable of hydrogen bonding with (a) and improving the fluidity of said additive concentrate, selected from the group consisting of carboxylic acid, sulfonic acid and phenols.

4,537,603
CYCLIC CHAR GASIFIER DEVOLATILIZATION PROCESS

Joseph C. Firey, P.O. Box 15514, Seattle, Wash. 98115

Continuation-in-part of Ser. No. 492,484, May 6, 1983, Division of Ser. No. 328,148, Dec. 7, 1981, abandoned, which is a continuation-in-part of Ser. No. 121,973, Feb. 15, 1980, abandoned. This application Oct. 31, 1984, Ser. No. 666,662
Int. Cl.³ C10J *3/04*
U.S. Cl. 48—197 R 4 Claims



1. A process of gasifying at least two char fuel masses within separate containers comprising the steps of:

compressing at least one reactant gas into the pores of at least one char fuel mass;

while concurrently expanding reacted gases out of the pores of at least one other char fuel mass;

alternating said compression process with said expansion process for each char fuel mass, with but one of said compression or expansion processes being applied to any one char fuel mass at any one time;

repeating said compression process alternated with said expansion process several times for each of said at least two char fuel masses;

continuing said compression process continuously to at least one char fuel mass at a time;

continuing said expansion process continuously to at least one char fuel mass at a time;

removing substantially all reacted gases as product gases, which have expanded outside the pores, from continued contact with said char fuel, during each expansion on each char fuel mass;

supplying at least one fresh reactant gas for each compression on each char fuel mass, said reactant gases comprising a gas essentially free of oxygen gas.

4,537,604

ABRASIVE AGGLOMERATES FOR USE IN SCOURING CLEANING COMPOSITIONS

Peter L. Dawson, Upton-by-Chester, England, assignor to Lever Brothers Company, New York, N.Y.

Filed Aug. 31, 1983, Ser. No. 528,186

Claims priority, application United Kingdom, Sep. 1, 1982, 8224944; Jul. 19, 1983, 8319441

Int. Cl.[3] C09K *3/14*

U.S. Cl. 51—298 23 Claims

1. Scouring cleaning compositions comprising from 5 to 99% by weight of an abrasive agent consisting of agglomerates of finely divided abrasive material having no particles of initial size above 20 micrometers, at least 80% by weight thereof being of initial size below 10 micrometers, and an organic binder for agglomerating such material, from 1 to 20% by weight of the binder being an oil-soluble anionic or cationic polar compound; the flexural strength of the agglomerates being above 1.5 kilograms.

4,537,605

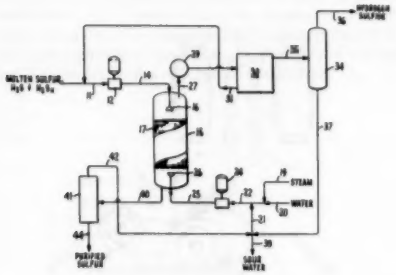
REMOVAL OF HYDROGEN SULFIDE FROM ELEMENTAL SULFUR BY A COUNTERCURRENT WET STEAM PROCESS

T. H. Gouw, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 398,804, Jul. 16, 1982, abandoned. This application Jan. 30, 1984, Ser. No. 574,948

Int. Cl.[3] B01D *53/14*

U.S. Cl. 55—48 6 Claims



1. A process for reducing the hydrogen sulfide content of hydrogen sulfide-contaminated petroleum byproduct elemental sulfur from 20 to 2000 pm by weight to less than 1 ppm by weight which comprises passing the elemental sulfur in liquid phase downward in countercurrent through upward flowing water and steam in a single contacting at a temperature of from 250° F. to 310° F., a pressure adequate to prevent total vaporization of the water and a water plus steam usage of from 0.3 to 2 pounds per pound of sulfur, wherein the water and steam is partially vaporized sour water having a pH of 4 to 7.

4,537,606

OXYGEN ENRICHED GAS SUPPLY ARRANGEMENT FOR COMBUSTION

Yoshimasa Itoh, Machida, and Shiroh Asakawa, Zama, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Asaha, Japan

Continuation of Ser. No. 331,902, Dec. 18, 1981, abandoned. This application Nov. 21, 1983, Ser. No. 553,430

Claims priority, application Japan, Dec. 19, 1980, 55-180686

Int. Cl.[3] B01D *53/22*

U.S. Cl. 55—158 12 Claims

1. An apparatus for providing an air supply enriched in an oxygen concentration which can be selectively varied for use for combustion purposes which comprises, in combination:

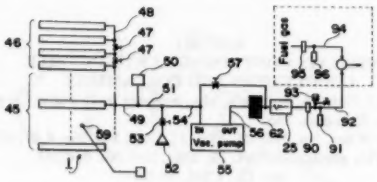
a membrane cell divided into a main gas permeating membrane including means for causing atmospheric air to flow through and along the surface of said main gas permeating membrane to obtain an oxygen enriched air stream,

means for supplying air to said membrane cell,

a plurality of auxiliary membranes connected in parallel with said main gas permeating membrane, including means for optionally directing at least a portion of the atmospheric air through said auxiliary membranes to obtain an oxygen enriched air stream,

means for controlling the number of auxiliary membranes to be utilized thereby controlling the flow rate of oxygen concentration of the oxygen enriched air obtained from the membrane cell together with pressure adjustment,

pressure reduction means having an inlet and outlet for causing atmospheric air to pass through said main membrane and auxiliary membranes, said pressure reduction means being disposed downstream from said main membrane and auxiliary membranes for providing oxygen enriched air to be adapted as combustion air to burn fuel in combustion,



by-pass means communicating at one end with said outlet of said pressure reduction means, and at a second end with said inlet of said pressure reduction means for recycling at least a portion of the air from said outlet to said inlet, said by-pass means containing means for controlling the amount of air to be recycled,

first atmospheric air inlet means connected with said inlet of said pressure reduction means for adjustably supplying atmospheric air to said inlet and

second atmospheric air inlet means connected with said outlet of said pressure reduction means for adjustably supplying atmospheric air to said outlet, wherein the amount of the oxygen concentration of the air to be discharged from the outlet of the pressure reduction means for use in combustion is selectively varied by the operation of the main and auxiliary membranes for control of the concentration and flow rate of the enriched air, the by-pass means and the first and second atmospheric air inlet means.

4,537,607

GAS FLOW CONTROLLERS FOR AIRCRAFT MOLECULAR SIEVE TYPE GAS SEPARATION SYSTEMS

Brian H. Rogers, and Paul A. Tucker, both of Yeovil, United Kingdom, assignors to Normalair-Garrett (Holdings) Limited, Yeovil, England

Filed Jul. 31, 1984, Ser. No. 636,265

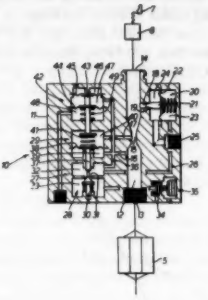
Claims priority, application United Kingdom, Aug. 3, 1983, 8320960

Int. Cl.[3] B01D *53/04*

U.S. Cl. 55—163 8 Claims

1. A gas flow controller for use in controlling the mass of air flowing through an aircraft molecular sieve type oxygen enrichment of air system, such flow controller having a gas flow duct connecting an inlet and an outlet by way of a venturi section, the inlet being arranged to receive product gas in the form of oxygen enriched air flowing from molecular sieve beds, and a servo-operated valve means for removing product gas from the gas flow duct downstream of the venturi section

comprising a servo-operated valve regulated both by an actuator means responsive to pressure difference through the venturi section, and by adjustment means having at least one



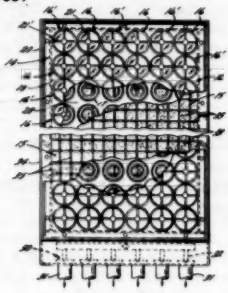
pressure responsive wall arranged to respond to the difference between duct pressure upstream of the venturi section and at least one varying external pressure conducted into the gas flow controller for applying a biasing force to the actuator means.

4,537,608

SYSTEM FOR REMOVING CONTAMINANT PARTICLES FROM A GAS

Evan E. Koslow, Westport, Conn., assignor to Pall Corporation, Glen Cove, N.Y.

Filed Nov. 16, 1983, Ser. No. 552,275
Int. Cl.³ B01D *50/00*
U.S. Cl. 55—337 **4 Claims**



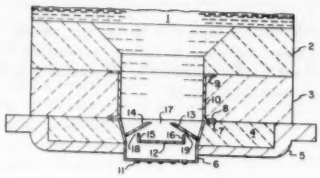
1. A system for removing contaminants from a gas, said system having, in combination, a housing having an inlet and an outlet to define a passage for the flow of gas carrying aerosol contaminants, a vortex cleaner assembly disposed within said passage and including a plurality of parallel tubes disposed in said passage and alined with the flow of gas through the passage, said tubes being alined in rows in each of two perpendicular directions, a plurality of vortex generators, one for each of said tubes and each disposed adjacent the inlet end of the associated tube to impart a rotational flow to the gas flowing through the tube, the rotational flow of the gas causing a major portion of the contaminants in the gas to be separated from the main flow of gas through said tubes, means for removing the separated contaminants from said passage, said vortex generators being constructed to impart rotational flows of preselected hands through said tubes with the flow through each tube being of the opposite hand from the flow through adjacent tubes in both of said perpendicular directions whereby the velocity vectors of the flow from any two tubes are in the same direction and of substantially the same magnitude in the region of adjacent flow so that the well-defined rotational flow of gas through said tubes is maintained without substantial turbulence as the gas leaves the vortex cleaner assembly, and a depth-type barrier filter disposed in said passage downstream of said vortex cleaner assembly between the vortex cleaner assembly and the outlet of the passage and extending across the passage to further remove contaminants from the gas as it passes through the filter by gradually converting the well-defined rotational flow of the gas to a well-defined laminar flow, said rotational flow facilitating penetration of said gas into said filter before conversion to laminar flow, thereby effecting deposition of contaminant particles throughout the thickness of said filter.

4,537,609

STONE TRAP AND METHOD OF USING FOR MAKING GLASS FIBERS

Eugene D. McEathron, Butler, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 4, 1984, Ser. No. 616,864
Int. Cl.³ C03B *37/085*
U.S. Cl. 65—1 **13 Claims**



4. A fiber glass forming bushing comprising an electrically heated container having four sides and a bottom, a plurality of tips on the bottom communicating with the interior of the container and through which molten glass may flow, a flange around the sides of the container at the top of the sides, means to attach the bushing to a forehearth opening, an elongated first baffle inclined upwardly from all sides of the bushing toward the center and defining an opening in the central portion of the bushing interior for the admission of molten glass therethrough, a second baffle member below said first baffle and spaced therefrom, said second baffle member having sidewalls sloped upwardly to a point adjacent to but below said first baffle to thereby define a narrow passage between the first baffle and the sides of said second baffle which communicates with the bottom of said container and means to maintain said first and second baffles spaced from each other as molten glass passes over their surfaces, and both baffles being positioned below the bushing flange.

4,537,610

METHOD AND APPARATUS FOR PRODUCING CHOPPED STRANDS

Gordon P. Armstrong, Newark, and Martin C. Flautt, Granville, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed May 24, 1984, Ser. No. 613,847
Int. Cl.³ C03C *25/02*
U.S. Cl. 65—3.44 **27 Claims**

1. A method of producing discrete bundles of filaments comprising:

drawing streams of glass into continuous filaments;

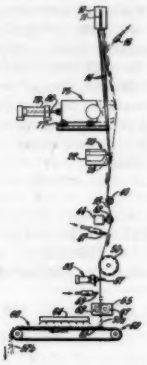
applying a molten, non-aqueous, hot melt coating material to the continuous filaments;

gathering the coated continuous filaments into a bundle;

solidifying said coating material on said continuous bundle to fixedly establish a first cross-sectional shape;

severing the bundle into discrete segments at a severing means, the severing step deforming the bundle segments

such that the bundle segments have a second cross-sectional shape at the severing regions; and



heating the bundle segments having the second cross-sectional shape sufficient to soften the coating material to permit the bundle segments to substantially return to the first cross-sectional shape.

4,537,611

METHOD FOR MANUFACTURING GLASS FROM THE GAS PHASE

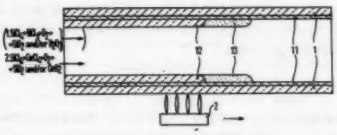
Nikolaos Douklias, Kirchheim, and Josef Grabmaier, Berg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 4, 1984, Ser. No. 607,264

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1983, 3327484

Int. Cl.³ C03B *19/06*

U.S. Cl. 65—18.2 **10 Claims**



1. A method for manufacturing glass by means of deposition from the vapor phase which comprises feeding reaction gases into a vapor phase reaction zone, said reaction gases being capable of reacting to form a glass-forming chemical compound in a chemical reaction, the conditions in said reaction zone being sufficient to initiate said chemical reaction and cause particles of said glass-forming chemical compound to deposit out of said reaction zone onto a solid surface in a deposition zone as soot, fusing said soot to form a glass film, feeding into said reaction zone micron-sized particles of said glass-forming chemical compound while said chemical reaction is occurring in said reacton zone, said particles acting as condensation nuclei, and being present in sufficient amount such that the rate of formation of said soot and the rate of its vapor phase deposition on said solid surface is increased.

4,537,612

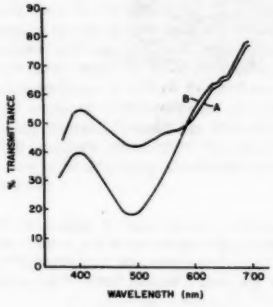
COLORED PHOTOCHROMIC GLASSES AND METHOD

Nicholas F. Borrelli, Elmira; George B. Hares, Corning; Dennis W. Smith, Corning, and Brent M. Wedding, Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Continuation-in-part of Ser. No. 364,472, Apr. 1, 1982, abandoned. This application Sep. 17, 1984, Ser. No. 650,846

Int. Cl.³ C03C *21/00, 3/26*

U.S. Cl. 65—30.11 **8 Claims**



1. A method for producing a permanent coloration in a surface zone on a photochromic glass article wherein silver halide is the photochromic agent, wherein the glass composition contains at least 1% by weight Li_2O, at least 2% by weight Na_2O, and at least 6% by weight $Li_2O+Na_2O+K_2O$, and wherein the glass article is heat treated at a temperature not exceeding about 450° C. under reducing conditions for a time at least sufficient to modify the light absorption characteristics of the article surface, the improvement comprising shifting the optical absorption band imparted to the article during the reduction treatment by (1) changing the content of said Na_2O in at least a portion of the surface coloration zone of the article by exchanging lithium ions and potassium ions from within the glass surface sodium ions from an external source, said exchanging being effected prior to said reduction treatment and by (2) controlling the conditions of and the extent of ion exchange such that said shifting will be effected to provide a new absorption band.

4,537,613

PRODUCT FOR THE FERTILIZATION OF MYCORHIZAL MUSHROOMS AND APPLICATION TO THE FERTILIZATION OF TRUFFLE-BEDS

Pierre-Jean Pebeyre, Cahors; René Gleyze, Valreas, and Charles Montant, Toulouse, all of France, assignors to S. A. Pebeyre, Cahors, France

Filed Jan. 19, 1984, Ser. No. 572,013

Claims priority, application France, Jan. 21, 1983, 83 01049

Int. Cl.³ C05F *13/00*

U.S. Cl. 71—5 **16 Claims**

1. A fertilizer for enhancing the mycorhization and/or the fructification of mycorhizal mushrooms selected from the group consisting of tuber melanosporum,

consisting essentially of a mixture of non-fermented organic substances of animal origin, organic substances of proteins and carbohydrates of vegetable origin, and at least one alkalizing compound selected from the group consisting of calcium compounds for raising the pH value of the mixture so that the mixture has a pH value greater than 8, the mutual proportions of the organic substances being adjusted so that the mixture has a C/N ratio of at least 10.

4,537,614
S-ARYL AND S-ALIPHATIC DIAMIDOPHOSPHOROTHIOLATES AS UREASE INHIBITORS AND UREASE INHIBITED UREA BASED FERTILIZER COMPOSITIONS

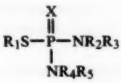
Michael Van Der Puy, Cheektowaga, N.Y.; Jaroslav F. Kolc, Randolph Township, Dover County, N.J.; Louis G. Anello, Hamburg; Larry L. Hendrickson, Camillus, both of N.Y.; Milorad M. Rogic, Whippany, and Michael D. Swerdloff, Parsippany, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 475,988, Mar. 16, 1983, abandoned. This application Feb. 3, 1984, Ser. No. 575,787

Int. Cl.³ C05C *9/00*

U.S. Cl. 71—28 **31 Claims**

22. An improved fertilizer composition comprising urea or one or more urea precursor compounds capable of forming urea in situ when subjected to the use conditions of the composition and a urease inhibiting effective amount of one or more phosphorothiolate compounds of the formula:



wherein

X is oxygen or sulfur;

R_1 is substituted or unsubstituted alkyl, cycloalkyl, heterocycle, alkenyl, alkynyl, cycloalkyl, aralkyl, aryl or alkaryl, wherein permissible substituents are one more trihalomethyl, alkyl, isocyano, isocyanato, halogen, phenoxy, phenyl, nitro, cyano amino, alkylamino, arylamino, diarylamino, dialkylamino, alkoxy, arylmercapto, mercapto, alkylcarbonyl, arylcarbonyl, carboxy, heterocycle, alkylmercapto, carbonamide, hydroxy, alkoxy, aryloxy, cyano, or acyloxy; and

R_2, R_3, R_4 and R_5 are individually hydrogen, or alkyl having from 1 to 4 carbon atoms.

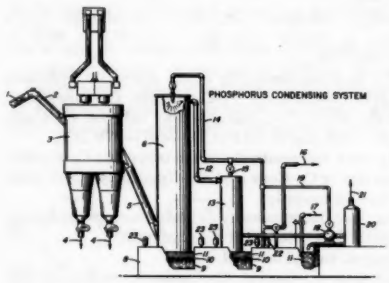
4,537,615
FERTILIZER FROM PHOSPHORUS FURNACE WASTE STREAM

James C. Barber, Florence, Ala., assignor to James C. Barber and Associates, Inc., Florence, Ala.

Division of Ser. No. 428,840, Sep. 30, 1982, Pat. No. 4,451,277, which is a continuation-in-part of Ser. No. 301,378, Sep. 11, 1981, Pat. No. 4,383,847, which is a division of Ser. No. 223,122, Jan. 7, 1981, Pat. No. 4,372,929. This application Jun. 10, 1983, Ser. No. 502,921

Int. Cl.³ C05B *7/00, 11/10*

U.S. Cl. 71—36 **5 Claims**



1. A process for the production of fluid fertilizer comprising the steps of:

(a) smelting a mixture of phosphate ore, reducing carbon, and silica rock in a submerged-arc electric furnace wherein a phosphorus-containing gas is evolved;

(b) cooling the phosphorus-containing gas in an adiabatic condenser wherein an aqueous slurry is sprayed into the condenser and phosphorus is condensed from the gas and collects as phosphorus and phosphorus sludge in a sump;

(c) further cooling the phosphorus-containing gas in a tubular condenser;

(d) collecting said phosphorus and phosphorus sludge together with condenser water from said adiabatic condenser in a sump;

(e) pumping phosphorus and phosphorus sludge together with condenser water from said sump in step (d) to a vessel for separation of phosphorus and phosphorus sludge and therein separating out phosphorus and, said sludge from the condenser water;

(f) processing phosphorus sludge into an acid mixture comprised of phosphoric and phosphorous acids;

(g) adding the mixture of acids of step (f) to said condenser water from said sump in step (d) where acids are neutralized by also adding an alkaline solution to form a neutralized slurry;

(h) recirculating neutralized slurry from step (g) as a recirculating stream to said adiabatic condenser to provide the slurry of step (b);

(i) bleeding off a stream of neutralized slurry from said recirculating neutralized slurry in step (h);

(j) mixing slurry bled off in step (i) with monoammonium phosphate, ammonia, and suspending clay to produce a base suspension fluid fertilizer; and

(k) processing phosphorus from step (e) into phosphoric acid in a production unit.

4,537,616
HERBICIDAL 2,6-DIOXOCYCLOHEXYLIDENE DERIVATIVES

David T. Manning, Raleigh, N.C., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 30, 1983, Ser. No. 509,456

Int. Cl.³ A01N *43/02*; C07D *239/02, 233/00, 243/04*

U.S. Cl. 71—92 **12 Claims**

1. A herbicidal composition comprising an acceptable carrier and an active toxidant wherein said toxicant comprises a herbicidally effective amount of a compound of the formula:

wherein:

Y is CH_2 or CHR^4; wherein R^4 is C_1–C_3 alkyl

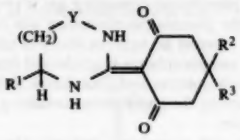
R^1 is hydrogen or C_1–C_3 alkyl, with the proviso that the number of carbon atoms in R^1 plus Y is less than or equal to 5;

R^2 is hydrogen or C_1–C_5 straight chain, branches or cyclic alkyl;

R^3 is C_1–C_3 straight chain alkyl or R^2 and R^3 together may form a cyclopentane or cyclohexane ring wherein the number of carbon atoms in R^2 plus R^3 is less than or equal to 6; and

n is 0, 1, or 2.

7. A method of controlling undesired plant growth which comprises subjecting said plant to a herbidically effective amount of the compound of the formula:



wherein:

Y is CH_2 or CHR^4, wherein R^4 is C_1–C_3 alkyl

R^1 is hydrogen or C_1–C_3 alkyl, with the proviso that the number of carbon atoms in R^1 plus Y is less than or equal to 5;

R^2 is hydrogen or C_1–C_5 straight chain, branches or cyclic alkyl;

R^3 is C_1–C_3 straight chain alkyl or R^2 and R^3 together may form a cyclopentane or cyclohexane ring wherein the number of carbon atoms in

R^2 plus R^3 is less than or equal to 6; and n is 0, 1, or 2.

4,537,617

3-PHENYL-4-METHOXYCARBONYLPYRAZOLES AND THEIR USE FOR CONTROLLING UNDESIRABLE PLANT GROWTH

Peter Plath, Ludwigshafen; Karl Eicken, Wachenheim; Hubert Sauter, Mannheim, and Bruno Wuerzer, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

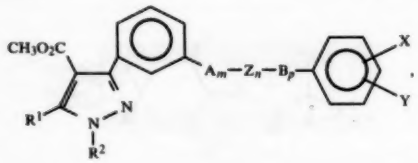
Filed Aug. 30, 1984, Ser. No. 645,770

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1983, 3331692

Int. Cl.³ A01N *43/56*; C07D *231/14*

U.S. Cl. 71—92 **10 Claims**

1. A 3-phenyl-4-methoxycarbonylpyrazole derivative of the formula



(I)

where R^1 is hydrogen or methyl, R^2 is hydrogen, unsubstituted or halogen-substituted C_1–C_4-alkanoyl, methoxycarbonyl, or phenoxycarbonyl which is unsubstituted or substituted by halogen or C_1–C_4-alkyl, or is hydroxymethyl or methoxymethyl, A and B independently of one another are each oxygen or sulfur, Z is unsubstituted or methyl-substituted alkylene of 1 to 5 carbon atoms, m, n and p independently of one another are each zero or 1, X is hydrogen, halogen or nitro and Y is hydrogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkyl, halogen, nitro or cyano.

10. A method for combatting the growth of unwanted plants, wherein the plants and/or their location are treated with a herbicidally effective amount of a 3-phenyl-4-methoxycarbonylpyrazole derivative of the formula I as defined in claim 1.

4,537,618

N-PHENYLSULFONYL-N'-PYRIMIDINYLUREAS

Rolf Schurter, Binningen; Werner Föry, Basel, and Willy Meyer, Riehen, all of Switzerland, assignors to Ciba Geigy Corporation, Ardsley, N.Y.

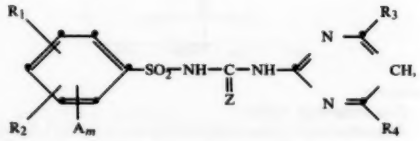
Filed May 19, 1983, Ser. No. 496,326

Claims priority, application Switzerland, May 26, 1982, 3232/82

Int. Cl.³ C07D *239/42*; A01N *47/36*

U.S. Cl. 71—92 **17 Claims**

1. An N-phenylsulfonyl-N'-pyrimidinylurea of the formula



wherein

A is a radical of the formula —C=O—K,

m is 1 or 2,

Z is oxygen or sulfur,

R is hydrogen, branched or unbranched C_1–C_9alkyl which is unsubstituted or substituted by halogen, hydroxyl, C_1C_4alkoxy, C_1–C_4alkylthio, C_1–C_4haloalkoxy, C_3–C_9cycloalkyl, cyano, —$COOR_6$, —$CONR_7R_8$ or by phenyl which is in turn unsubstituted or substituted by halogen, C_1–C_4alkyl, C_1–C_4alkoxy, nitro, cyano or trifluoromethyl; or is C_3–C_9 cycloalkyl which is unsubstituted or substituted by halogen, hydroxy, C_1–C_4alkyl, C_1–C_4alkoxy, C_1–C_4alkylthio, cyano, —$COOR_6$, —$CONR_7R_8$; or is phenyl or phenyl substituted by halogen, nitro, cyano, C_1–C_4alkyl, C_1–C_4alkoxy, C_1–C_4alkylthio, trifluoromethyl, —$COOR_6$ or —$CONR_7R_8$; or is a 5- or 6-membered heterocyclic ring selected from the group consisting of furan, thiophene, pyrrole, pyrazole, triazole, pyridine, pyrimidine, pyridazine, triazine, thiazole, oxazole, thiadiazole and oxadiazole, which is unsubstituted or substituted by halogen, C_1–C_4alkyl C_1–C_4alkoxy, —$COOR_6$ or —$CONR_7R_8$,

R_1 is hydrogen, halogen, C_1–C_5alkyl, C_2–C_5alkenyl or a radical —Y—R_5,

R_2 is hydrogen, halogen, C_1–C_5alkyl, C_2–C_5alkenyl, C_1–C_4haloalkyl, a radical —Y—R_5, —$COOR_6$, —NO_2 or —CO—NR_7—R_8,

R_3 and R_4, each independently of the other, are hydrogen, C_1–C_4alkyl, C_1–C_4alkoxy, C_1–C_4alkylthio, C_1–C_4haloalkyl, C_1–C_4haloalkoxy, C_1–C_4haloalkylthio, halogen, C_2–C_5alkoxyalkyl, —NR_9R_{10} or —O—CH_2—CH_2—NR_9R_{10},

R_5 and R_6, each independently of the other, are C_1–C_5alkyl, C_2–C_5alkenyl or C_2–C_6alkynyl, C_1–C_5haloalkyl, C_2–C_5alkenyl or C_2–C_6alkoxyalkyl,

R_7 and R_8, each independently of the other, are hydrogen, C_1–C_5alkyl, C_2–C_5alkenyl or C_2–C_6alkynyl,

R_9 is hydrogen, methyl or ethyl,

R_{10} is hydrogen, C_1–C_4alkyl, C_1–C_4alkoxy, methoxymethyl, cyanomethyl, cyanoethyl, C_3–C_5alkenyl or C_3–C_6alkynyl, and

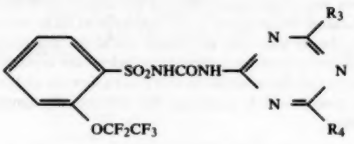
Y is oxygen, sulfur, a sulfinyl or sulfonyl bridge, or a salt thereof.

4,537,619
N-PHENYLSULFONYL-N'-TRIAZINYLUREAS

Willy Meyer, Riehen, and Werner Föry, Basel, both of Switzerland, assignors to Ciba Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 282,779, Jul. 13, 1981, abandoned. This application Jan. 17, 1983, Ser. No. 458,694
Claims priority, application Switzerland, Jul. 17, 1980, 5481/80; Nov. 5, 1980, 8216/80; Jun. 17, 1981, 3991/81
Int. Cl.³ C07D *251/46, 251/22, 251/42;* A01N *43/66*
U.S. Cl. 71—93 8 Claims

1. A compound of the formula:



wherein R_3 is chloro, fluoro, methyl, chloromethyl, ethoxy, isopropyloxy, ethyl or methoxy, and R_4 is methyl, ethyl, methoxy or ethoxy.

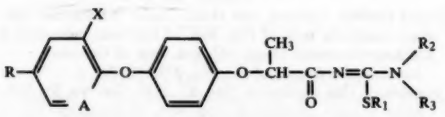
4. A herbicidal and growth regulating composition which comprises an effective amount of at least one compound according to claim 1, together with a suitable carrier therefor.

4,537,620
ARYLOXYPHENOXY PROPONYL ISOTHIOUREAS AND USE AS HERBICIDES

Ferenc M. Pallos, Walnut Creek, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Jul. 2, 1984, Ser. No. 626,844
Int. Cl.³ C07D *211/90;* B21B *19/12*
U.S. Cl. 71—94 15 Claims

1. As new compounds, acyl isothiourea substituted aryloxyphenoxy propionic acids having the formula



wherein

R is CF_3 or halogen;

X is hydrogen or halogen;

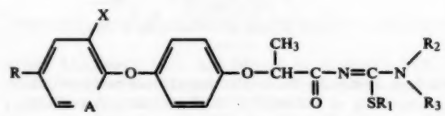
A is CH or nitrogen;

R_1 is hydrogen, lower alkyl, alkenyl, alkynyl, phenyl, cyanoalkyl, alkoxyalkyl, or alkoxycarbonylalkyl;

R_2 is hydrogen, lower alkyl, phenyl, or substituted phenyl; and

R_3 is acyl or halogen substituted acyl selected from the group consisting of propionyl, dichloro bromoacetyl, propionaminocarbonyl and phenylaminocarbonyl.

6. A herbicidal composition which comprises a herbicidally effective amount of a compound having the formula



wherein

R is CF_3 or halogen;

X is hydrogen or halogen;

A is CH or nitrogen;

R_1 is hydrogen, lower alkyl, alkenyl, alkynyl, phenyl, cyanoalkyl, alkoxyalkyl, or alkoxycarbonylalkyl;

R_2 is hydrogen, lower alkyl, phenyl, or substituted phenyl; and

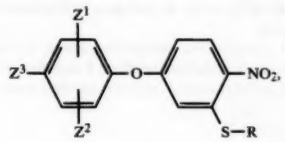
R_3 is acyl or halogen substituted acyl selected from the group consisting of propionyl, dichloro bromoacetyl, propionaminocarbonyl and phenylaminocarbonyl; and an inert diluent carrier.

4,537,621
HERBICIDAL DIPHENYL ETHERS AND THEIR USE FOR CONTROLLING UNDESIRABLE PLANT GROWTH

Adolf Parg, Bad Durkheim; Hans Ziegler, Mutterstadt, and Bruno Wuerzer, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 31, 1983, Ser. No. 481,100
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1982, 3212165
Int. Cl.³ A61N *9/12;* C07C *145/00*
U.S. Cl. 71—103 10 Claims

1. A diphenyl ether of the formula



(I)

where Z^1 and Z^2 independently of one another are each hydrogen, halogen, nitro, cyano, carboxyl, C_1–C_4-alkyl, C_1–C_4-haloalkyl or C_1–C_4-alkoxy, Z^3 is halogen, nitro, cyano, C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy, C_1–C_4-alkylmercapto, C_1–C_4-haloalkylmercapto, C_1–C_4-alkylsulfinyl, C_1–C_4 -haloalkylsulfinyl, C_1–C_4-alkylsulfonyl or C_1–C_4 -haloalkylsulfonyl, and R is, halogen or —X—R^1, where X is oxygen or sulfur and R^1 is hydrogen, C_1–C_{20}-alkyl, C_2–C_{20}-alkoxyalkyl, C_2–C_{20}-alkylthioalkyl, C_2–C_{20}-alkylaminoalkyl, C_3–C_{20}-dialkylaminoalkyl, C_1–C_{20}-haloalkyl, an unsubstituted or halogen-substituted phenyl alkyl radical of 7 to 9 carbon atoms, C_2–C_8-alkenyl, C_2–C_8-haloalkenyl or C_2–C_8-alkynyl, carboxyalkyl, alkoxycarbonylalkyl or carbamylalkyl of not more than 6 carbon atoms, cycloalkyl of 3 to 20 carbon atoms or unsubstituted phenyl or phenyl substituted by halogen, C_1–C_4-alkyl, C_1–C_4-haloalkyl, cyano or —O—$(CHR^4)_n$—$COOR^5$, where R^4 is hydrogen, methyl, ethyl or propyl, R^5 is alkyl of 1 to 4 carbon atoms and n is 1, 2, or 3, R is —NR^2R^3, where R^2 and R^3 are identical or different and have the meanings stated for R^1, or if R^3 is hydrogen or C_1–C_4-alkyl, R^2 is hydroxyl or C_1–C_{20}-alkoxy, or is C_1–C_{20}-alkoxy which is substituted by C_1–C_6-alkoxy, C_1–C_6-alkylthio, C_1–C_6-alkylamino, C_2–C_6-dialkylamino, halogen, carboxylalkyl, alkoxycarbonyl or phenyl, or is unsubstituted phenoxy or phenoxy substituted by halogen or C_1–C_4-alkyl or unsubstituted, C_1–C_{20}-alkyl-substituted or phenyl-substituted amino, or R^2 and R^3 together with the nitrogen atom to which they are attached are azetidino, pyrrolidino, piperidino, morpholino, 2,6-dimethylmorpholino, piperazino, 2,6-dimethylpiperazino, N-methylpiperazino or N-ethylpiperazino .

10. A process for combating the growth of unwanted plants, wherein the unwanted plants or the area to be kept free from unwanted plant growth are treated with a herbicidally effective amount of a diphenyl ether of the formula I as claimed in claim 1.

4,537,622

DIURETHANES AND SELECTIVE HERBICIDAL AGENT CONTAINING THEM

Gerhard Boroschewski, and Friedrich Arndt, both of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

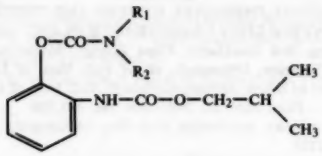
Continuation of Ser. No. 44,547, Jun. 1, 1979, abandoned, which is a continuation of Ser. No. 935,106, Aug. 21, 1978, abandoned, which is a continuation of Ser. No. 849,168, Nov. 7, 1977, abandoned. This application Jun. 6, 1980, Ser. No. 157,638

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1976, 2651526

Int. Cl.[3] *C07C 125/07, 125/075;* **A01N** *37/36, 37/44*

U.S. Cl. 71—108 **21 Claims**

1. Diurethanes of the general formula



in which

R_1 is alkyl, alkenyl or halogen alkyl and

R_2 is phenyl, or phenyl or cyclohexyl mono- or poly-substituted, equally or differently, by halogen, trifluoromethyl, alkyl and/or alkoxy.

21. A herbicidal composition comprising about 10 to 80 weight-% of a compound as defined in claim 1 and about 90 to 20 weight-% liquid or solid carrier material administered as a spray solution.

4,537,623

HERBICIDAL 2-(OXA OR THIA HETEROCYCLE)5-AMINO-3-OXO-4-(SUBSTITUTED-PHENYL)-2,3-DIHYDROFURANS

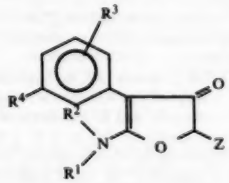
Carl E. Ward, San Jose, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Mar. 29, 1984, Ser. No. 594,497

Int. Cl.[3] **A01N** *43/02, 43/00;* **C07D** *333/00*

U.S. Cl. 71—90 **35 Claims**

1. A compound having the formula:



(I)

wherein

R^1 and R^2 are independently hydrogen, lower alkyl having 1 through 4 carbon atoms or alkenyl having 3 through 6 carbon atoms;

R^3 is hydrogen, lower alkyl, lower alkoxy, halo, or trifluoromethyl and can be at any available position on the phenyl ring;

R^4 is lower alkyl, lower alkoxy, halo, or trifluoromethyl;

Z is a saturated or unsaturated sulfur or oxygen heterocycle radical having 5 or 6 ring atoms one of which is sulfur or oxygen and the remainder of which are carbon atoms;

and compatible cation salts thereof.

4,537,624

AMORPHOUS METAL ALLOY POWDERS AND SYNTHESIS OF SAME BY SOLID STATE DECOMPOSITION REACTIONS

Michael A. Tenhover; Richard S. Henderson, both of Solon, and Robert K. Grasselli, Aurora, all of Ohio, assignors to The Standard Oil Company (Ohio), Cleveland, Ohio

Filed Mar. 5, 1984, Ser. No. 586,380

Int. Cl.[3] **B22F** *3/24, 9/00*

U.S. Cl. 75—0.5 B **44 Claims**

1. A process for the synthesis of a substantially amorphous metal alloy comprising thermally decomposing at least one precursor metal-bearing compound at a temperature below the crystallization temperature of the amorphous metal alloy to be formed, the at least one precursor metal-bearing compound having a decomposition temperature below the crystallization temperature of the amorphous alloy to be formed and containing the metals which comprise the substantially amorphous metal alloy.

4,537,625

AMORPHOUS METAL ALLOY POWDERS AND SYNTHESIS OF SAME BY SOLID STATE CHEMICAL REDUCTION REACTIONS

Michael A. Tenhover; Richard S. Henderson, and Joseph R. Fox, all of Solon, Ohio, assignors to The Standard Oil Company (Ohio), Cleveland, Ohio

Filed Mar. 9, 1984, Ser. No. 588,014

Int. Cl.[3] **B22F** *3/24, 9/00*

U.S. Cl. 75—0.5 A **41 Claims**

1. A process for the synthesis of a substantially amorphous metal alloy powder comprising disposing at least one metal-bearing compound in a liquid medium and reducing the at least one metal-bearing compound so as to form a substantially amorphous metal powder.

4,537,626

METHOD FOR THE PRODUCTION OF REACTION GASES

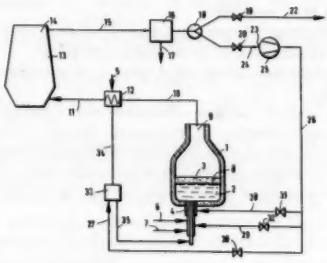
Roland Pfeiffer, Cologne, and Heinz-Dieter Waldhecker, Bergisch Gladbach, both of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 279,437, Jul. 1, 1981, abandoned. This application Nov. 15, 1983, Ser. No. 551,919

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1980, 3024977

Int. Cl.[3] **C22B** *5/12*

U.S. Cl. 75—35 **8 Claims**



1. In a method for the production of reaction gases consisting essentially of CO and H_2 in which reactants including a carbonaceous source, slag formers and an oxygen-containing gas are directed in the form of jets through nozzles under the surface of a molten metal bath in a reactor to produce said reaction gases, and said reaction gases are passed to a metallurgical reduction reactor wherein exhaust gases are produced

containing CO_2, CO, H_2O and H_2, the improvement which comprises:

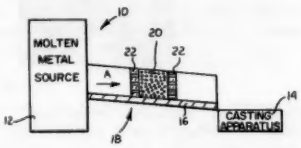
recycling at least a portion of said exhaust gases into heat exchange relationship with said nozzles in said reactor to cool the same.

4,537,627

TECHNIQUE FOR REMOVING IMPURITIES FROM A COPPER MELT

Derek E. Tyler, Cheshire; Harvey P. Cheskis, North Haven, and Paul D. Tungatt, Middletown, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Apr. 11, 1984, Ser. No. 599,098
Int. Cl.³ C22B *15/00*
U.S. Cl. 75—76 **16 Claims**



1. A process for forming a structure for removing impurities from a molten copper or copper base alloy, said process comprising:

providing a material in a solid state consisting essentially of from about 5% to about 99% silicon carbide and the balance being selected from at least one of a filler material and a bonding material; and

treating said material to expose silicon carbide particles at the outer periphery of said material to permit removal of said impurities by contact between said exposed silicon carbide particles and said molten copper or copper base alloy, said treating step maintaining said particles in an unoxidized condition.

4,537,628

RECOVERY OF PRECIOUS METALS

Vaikuntam I. Lakshmanan, Mississauga, and Jurgen K. Biskupski, Toronto, both of Canada, assignors to Ontario Research Foundation, Mississauga, Canada

Filed Dec. 6, 1983, Ser. No. 558,469
Claims priority, application United Kingdom, Dec. 7, 1982, 8234879; Jun. 14, 1983, 8316161; Jun. 14, 1983, 8316163
Int. Cl.³ C22B *11/00*
U.S. Cl. 75—118 R **13 Claims**

1. In a method of recovery of a precious metal from a sulphide-containing arsenic- and/or antimony-containing precious metal-containing material, the improvement which comprises treating said material with H_2SO_5 to oxidize at least part of the arsenic and/or antimony content of the material to a water-soluble form prior to processing to effect said precious metal recovery.

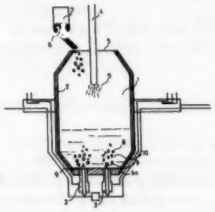
4,537,629

METHOD FOR OBTAINING HIGH PURITY DUCTILE IRON

Arturo Lazcano-Navarro, and Miguel A. Alcantara, both of Saltillo, Mexico, assignors to Instituto Mexicano de Investigaciones Siderurgicas, Saltillo, Mexico

Filed Aug. 20, 1984, Ser. No. 642,256
Int. Cl.³ C22C *33/08*
U.S. Cl. 75—130 R **11 Claims**

1. The method for obtaining high purity ductile iron comprising the steps of using sponge iron as a raw material, and melting it to form a molten bath in a basic lining converter by the energy of an external reaction between carbon and oxygen



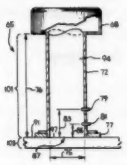
injected into the metal bath through nozzles extending through the converter lining.

4,537,630

ACOUSTIC IMPEDANCE MEASUREMENT

Asif A. Syed, Loveland, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed May 31, 1983, Ser. No. 499,641
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—589 **6 Claims**



3. A method, which includes the use of an acoustic waveguide, for measuring the acoustic impedance of a sample laminated material having normal and transverse directions definable therein, having a first, acoustically hard, outer face, and a second outer face, and having an internal cellular matrix such that no boundary exists in the matrix which

(i) comprises walls of the cells

(ii) extends in the normal direction

(iii) diminishes acoustic propagation in the transverse directions

(iv) is similar in size and shape to the cross-sectional shape of the acoustic waveguide,

the method comprising the following steps:

(a) measuring the actual acoustic impedance of a reference material which is similar in structure and composition to the sample material;

(b) measuring the apparent acoustic impedance of the reference material without taking active measures to diminish transverse acoustic propagation;

(c) deriving a correction factor based on the actual and apparent acoustic impedance values according to a predetermined formula;

(d) measuring the apparent reflection coefficient of the sample material in a manner similar to the measurement of (b); and

(e) inferring the actual acoustic impedance of the sample material from the apparent reflection coefficient of (d) and

the correction factor of (c) according to a predetermined formula.

4,537,631

INK JET INK FORMULATION FOR REDUCED START-UP PROBLEMS

Theodore M. Cooke, Danbury; Robert A. Lin, New Town; Richard G. Whitfield, Brookfield, and Allan G. Hock, New Milford, all of Conn., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 327,994, Dec. 7, 1981, Pat. No. 4,400,215. This application Aug. 12, 1983, Ser. No. 522,837
The portion of the term of this patent subsequent to Aug. 23, 2000, has been disclaimed.
Int. Cl.[3] C09D *11/02*
U.S. Cl. 106—22 10 Claims

1. A ink jet ink comprising about 5–15 weight percent oleic acid, about 47.5 to 60.0 weight percent benzyl ether, and at least one dye component.

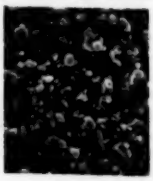
8. An ink jet ink comprising dibutyl sebacate and typophor black.

4,537,632

SPHERICAL ALUMINUM PARTICLES IN COATINGS

Mark F. Mosser, Sellersville, Pa., assignor to Sermatech International, Inc., Limerick, Pa.

Filed Oct. 19, 1983, Ser. No. 543,281
Int. Cl.[3] C09D *5/10*
U.S. Cl. 106—14.12 33 Claims



CONVENTIONAL AIR ATOMIZED ALUMINUM POWDER MANUFACTURED BY REYNOLDS AT 1,700°F REFERRED TO HERE AS AVERAGE PARTICLE SIZE OF 4.5-5 MICRONS. THEY ARE ROUNDED AND OF IRREGULAR SIZE AND SHAPES

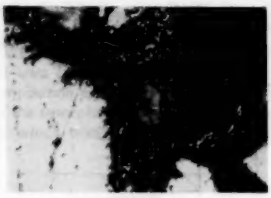
1. A coating composition especially suitable for coatings which have improved surface profile, corrosion resistance, erosion resistance and which are capable of faster curing and becoming electrically conductive more rapidly, which coating composition comprises (a) and aqueous acid binder solution which comprises phosphate ions and ions selected from the group consisting of chromate and molybdate ions,and (b) a powder which comprises atomized aluminum spheroids having an average particle size (measured in ESD) not larger than about 4 microns.

4,537,633

PORTLAND CEMENT, PROCESS FOR PREPARING SAME, AND COMPOSITIONS CONTAINING SAME

Won P. Hong, Chungnam, Rep. of Korea, assignor to Suh Kyung Suk, Seoul, Rep. of Korea

Filed Jun. 10, 1983, Ser. No. 503,107
Claims priority, application Rep. of Korea, Feb. 2, 1983, 83-396
Int. Cl.[3] C04B *7/04;* B32B *13/00*
U.S. Cl. 106—96 18 Claims



1. A Portland cement composition comprising
(1) dry powder of Portland cement, whose surface is coated with an asphalt film, and
(2) particles of carbon black.

4,537,634

COMPOUNDS AND THEIR USE AS INSOLUBILIZERS FOR BINDERS FOR PAPER COATING COMPOSITIONS

William C. Floyd, Chester, S.C., assignor to Sun Chemical Corporation, New York, N.Y.

Division of Ser. No. 500,283, Jun. 1, 1983,. This application Nov. 2, 1984, Ser. No. 667,716
Int. Cl.[3] C08B *31/00;* C08L *3/00*
U.S. Cl. 106—214 4 Claims

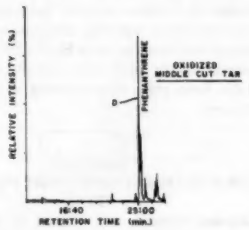
1. A paper coating composition comprising a pigment, a binder, and as an insolubilizer for the binder the hemiacetal product of the reaction of glyoxal and a polyol selected from the group consisting of glycerin, sorbitol, dextrine, α-methyl-glucoside, and their mixtures.

4,537,635

TAR FRACTION FOR DRIVEWAY SEALERS USING OXIDIZED COAL TAR DISTILLATE

Edward F. Bart, Califon, N.J.; Arthur S. Chu, E. Amherst, and George R. Cook, Buffalo, both of N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Dec. 5, 1983, Ser. No. 557,784
Int. Cl.[3] C08L *95/00;* C09D *3/24;* C10C *3/04*
U.S. Cl. 106—277 8 Claims



2. A coal tar sealer emulsion composition having a liquid consistency for applying to paved surfaces comprising
(a) a coal tar derivative,
(b) a filler and
(c) water

wherein (a) is an oxidized middle cut derivative of heavy coal tar oil said middle cut containing less than 10 percent of material boiling below the boiling point of phenanthrene, and having a float test analysis of between about 150 seconds and 400 seconds as determined by ASTM D139-77 and (b) and (c) are present in sufficient amounts to provide the desired viscosity.

4,537,636

PROCESS FOR THE PREPARATION OF NACREOUS PIGMENTS WITH IMPROVED GLOSS PROPERTIES, PRODUCTS THEREOF, AND COMPOSITIONS USING SAID PIGMENTS

Horst Bernhard, Schwarzenberg, Austria, and Reiner Esselborn, Darmstadt, Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 453,045, Dec. 27, 1982, Pat. No. 4,494,993. This application Mar. 30, 1983, Ser. No. 480,200
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1982, 3211602
Int. Cl.³ C09C *3/00*
U.S. Cl. 106—291 **7 Claims**

1. A process for preparing nacreous pigments having improved gloss properties and based on mica platelets coated with metal oxides, comprising suspending mica platelets in a first aqueous medium comprising aluminum, silicon and titanium ions corresponding to the amount to be incorporated into the metal oxide layer and uniformly coprecipitating thereon titanium dioxide hydrate, silicon dioxide and aluminum hydroxide to form a uniform layer homogeneously containing about 0.1 to about 20 percent by weight of SiO_2 and about 0.1 to about 20 percent by weight of Al_2O_3, wherein the uniform coprecipitation of the titanium, silicon and aluminum is achieved by suspending mica platelets in an aqueous solution of a pH of about 0.5–5, heating the solution to about 50°–100° C., adding a soluble titanium salt thereto and maintaining the solution pH substantially constant, and simultaneously adding SiO_2 to the solution in the form of a soluble silicate salt, these additions being effected in the presence of aluminum ions in the solution, and then separating, washing, drying and calcining the coated mica platelets; suspending the coated mica platelets in a second aqueous medium containing titanium sulfate prior to the point at which the titanium solution has begun substantially to hydrolyze to hydrated titanium dioxide, further coating the suspended platelets by slow heating of the suspension, and then separating, washing and calcining the further coated platelets.

6. Nacreous pigments based on mica flakes prepared by the process of claim 1.

7. In a composition comprising a base ingredient and a nacreous pigment prepared by suspending mica platelets in a first aqueous medium comprising aluminum, silicon and titanium ions corresponding to the amount to be incorporated into the metal oxide layer and uniformly coprecipitating thereon titanium dioxide hydrate, silicon dioxide and aluminum hydroxide to form a uniform layer homogeneously containing about 0.1 to about 20 percent by weight of SiO_2 and about 0.1 to about 20 percent by weight of Al_2O_3, wherein the uniform coprecipitation of the titanium, silicon and aluminum is achieved by suspending mica platelets in an aqueous solution of a pH of about 0.5–5, heating the solution to about 50°–100° C., adding a soluble titanium salt thereto and maintaining the solution pH substantially constant, and simultaneously adding SiO_2 to the solution in the form of a soluble silicate salt, these additions being effected in the presence of aluminum ions in the solution, and then separating, washing, drying and calcining the coated mica flakes; the improvement which comprises suspending the coated mica platelets in a second aqueous medium containing titanium sulfate prior to the point at which the titanium solution has begun substantially to hydrolyze to hydrated titanium dioxide, further coating the suspended platelets by slow heating of the suspension, and then separating, washing and calcining the further coated platelets.

4,537,637

HYDRATION DRYING PROCESS

George L. K. Hunter, Atlanta; Daniel B. Dennison, Tucker, and Charles E. Stephens, Dunwoody, all of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Continuation-in-part of Ser. No. 179,452, Aug. 19, 1980, abandoned. This application Feb. 2, 1983, Ser. No. 463,187
Int. Cl.³ C13F *5/00*
U.S. Cl. 127—60 **12 Claims**

1. A process for drying a solids-containing aqueous product comprising the steps of:

adding the aqueous product to a pre-determined quantity of particulate anhydrous alpha-dextrose and aqeous product;

hydrating said particulate anhydrous alpha-dextrose with the aqueous component of the aqueous product by repeatedly agitating the particulate anhydrous alpha-dextrose and the aqueous product in a violent manner, whereby a substantial portion of the anhydrous alpha-dextrose is hydrated to alpha-dextrose monohydrate by the water in the aqueous product; and

maintaining the temperature of the hydrating particulate anhydrous alpha-dextrose and aqueous product at or below 50° C. by allowing the anhydrous alpha-dextrose, aqueous product and alpha-dextrose monohydrate to remain quiescent after each agitating step whereby the heat generated by the agitating step is dissipated and the temperature of the alpha-dextrose monohydrate and the remaining anhydrous alpha-dextrose and aqueous product is maintained at or below 50° C.; wherein

the hydration reaction is not inhibited by temperatures greater than 50° C. and a dry, free-flowing non-hygroscopic powder results;

conditions are such that temperature would rise above 50° C. in the absence of admixing using intermittent, brief periods of substantially violent agitation; and

formation of the dry, free-flowing non-hygroscopic powder is a result of water in the aqueous product forming alpha-dextrose monohydrate.

4,537,638

METHOD FOR REMOVAL OF UNDESIRABLE ORGANIC MATTER

Arthur W. Petersen, Chatham Township, Morris County, and Dennis T. Smialowicz, Waldwick, both of N.J., assignors to American Cyanamid Co., Stamford, Conn.

Continuation-in-part of Ser. No. 458,229, Jan. 17, 1983, abandoned. This application Jun. 6, 1984, Ser. No. 617,156
Int. Cl.³ B08B *3/08*; C09D *9/00*
U.S. Cl. 134—2 **9 Claims**

1. A method for facilitating the removal of undesirable organic matter from a surface which comprises contacting said organic matter, with a substantially loosening effective amount of an active ingredient consisting essentially of from 1 to 25% by weight of a compound selected from imidazole, pyrazole, an alkyl or aryl substituted imidazole, an alkyl or aryl substituted pyrazole, or a mixture of two or more thereof, in the substantial absence of an alkali metal hydroxide, for a time sufficient to effect a substantial loosening of said organic matter and wherein said compound is in liquid form at use temperature.

4,537,639

METHOD FOR CLEANING WELD SMUT FROM A SURFACE

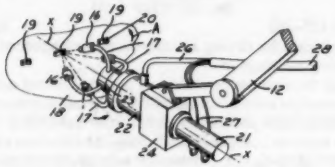
Forrest A. Shook, Fenton, Mich., assignor to NLB Corp., Wixom, Mich.

Filed Sep. 12, 1983, Ser. No. 531,463
Int. Cl.³ B08B *3/02*
U.S. Cl. 134—10 **5 Claims**

1. A method for cleaning weld smut from a surface having studs welded thereto with a jet spray device having a plurality of rotatable tubular arms radially spaced from the stud directed

to a zone of concentration on the surface comprising the steps of:

aiming the jet spray device at one of the studs so that the tubular arms are inwardly directed at a zone of concentration spaced radially from the base of the stud and said tubular arms are encircling the stud;



directing a fluid under high pressure through the tubular arms and spraying the high pressure fluid against said zone of concentration; and,

rotating said tubular arms about the stud during said spraying step to spinningly focus said spray in a narrow band of surface area at said zone of concentration.

4,537,640

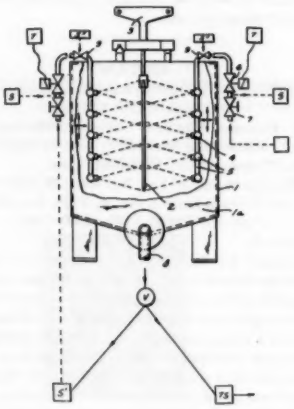
RINSING OF ARTICLES TO REMOVE AN ADHERING SUBSTANCE

Rudolf Kreisel, Nuremberg, and Walter Meyer, Berlin, both of Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkammen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 829,255, Aug. 30, 1977, abandoned. This application Sep. 23, 1981, Ser. No. 304,971

Int. Cl.³ B08B *3/02*

U.S. Cl. 134—18 **9 Claims**



1. A method of rinsing articles to remove an adhering substance, particularly subsequent to chemical or electrochemical surface treatment of the articles, comprising the steps of

positioning an article to be rinsed in a confined space;

spraying a rinsing agent onto the article at a pressure of between substantially 2 and 6 bar for a first period of time corresponding to between substantially 0.1 and 5 seconds to remove an adhering substance from a surface of the article with keeping the surface intact;

terminating the spraying and allowing the rinsing agent to run off the article for a second period of time corresponding to between substantially 1 and 10 seconds and which is at least substantially equal to or greater than said first period; and

repeating the spraying and terminating steps with the same time periods.

4,537,641

PROCESS FOR PRODUCING VALVE-METAL ANODES FOR ELECTROLYTIC CAPACITORS

Wolf-Wigand Albrecht; Axel Hoppe, both of Bad Harzburg; Uwe Papp, Goslar, and Rudiger Wolf, Vienenburg, all of Fed. Rep. of Germany, assignors to Hermann C. Starck Berlin, Berlin, Fed. Rep. of Germany

Filed Mar. 16, 1984, Ser. No. 590,740

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1983, 3309891

Int. Cl.³ H01G *9/05*

U.S. Cl. 148—11.5 P **10 Claims**

1. A process for producing a valve-metal anode for electrolytic capacitors which comprises heating under a high vacuum or under an inert gas atmosphere a previously heat-treated, shaped and pressed mass of valve-metal powder in the presence of a reducing metal at a temperature above the melting point of the reducing metal and below a temperature conventionally used for sintering a valve-metal anode.

4,537,642

METHOD OF MANUFACTURING AL-STABILIZED SUPERCONDUCTOR

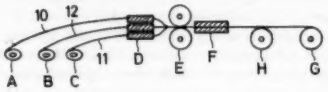
Shigeo Saito, and Masayuki Nagata, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jan. 18, 1984, Ser. No. 571,761

Claims priority, application Japan, Jan. 19, 1983, 58-6993

Int. Cl.³ H01B *12/00*

U.S. Cl. 148—11.5 Q **8 Claims**



1. A method of manufacturing an Al-stabilized superconductor, comprising combining into a composite an Al tape or ribbon and a superconductive wire comprised of a material selected from the group consisting of Cu and Cu alloy matrix by rolling.

4,537,643

METHOD FOR THERMOMECHANICALLY ROLLING HOT STRIP PRODUCT TO A CONTROLLED MICROSTRUCTURE

John E. Thomas, Pittsburgh; Ronald D. Gretz, Tarentum, and George W. Tippins, Pittsburgh, all of Pa., assignors to Tippins Machinery Company, Inc., Pittsburgh, Pa.

Division of Ser. No. 397,789, Jul. 13, 1982, Pat. No. 4,505,141. This application Jul. 11, 1984, Ser. No. 629,579

Int. Cl.³ C21D *7/14*

U.S. Cl. 148—12 R **10 Claims**

1. A method of thermomechanically rolling a steel hot strip product to a controlled microstructure on a hot strip mill including a final reducing stand and an incubator positioned along a runout table intermediate first and second cooling means comprising in sequence:

A. causing the strip to leave the final reducing stand at a temperature above the A_3;

B. cooling said strip below the A_3 by the first cooling means;

C. coiling the strip in the incubator;

D. holding the strip in the incubator between the A_1 and A_3 temperatures to cause nucleation and growth of ferrite particles in austenite;

E. decoiling the strip out of the incubator; and

F. cooling said strip out of the incubator by the second

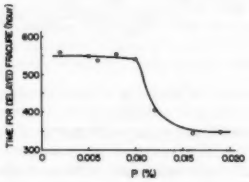
cooling means to minimize grain growth and carbide coarsening.

4,537,644

HIGH-TENSION HIGH-TOUGHNESS STEEL HAVING EXCELLENT RESISTANCE TO DELAYED FRACTURE AND METHOD FOR PRODUCING THE SAME

Jiro Tominaga, Hikari; Hiroshi Yada, and Mitsuo Honda, both of Kitakyushu, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Sep. 21, 1982, Ser. No. 420,685
Claims priority, application Japan, Sep. 28, 1981, 56-153484
Int. Cl.³ C22C *38/14, 38/28, 38/32*
U.S. Cl. 148—36 **17 Claims**



1. A high tensile tension high-toughness steel excellent in resistance to delayed fracture, having a tempered martensitic structure obtained by quenching and tempering and having a tensile strength of at least 100 kg/mm^2 and consisting essentially, by weight, of 0.15 to 0.50% of C, up to 1.50% of Si, 0.20 to 1.50% of Mn, up to 2.00% of Cr, 0.0005 to 0.0030% of B, 0.005 to 0.10% of acid-soluble Al, up to 0.010% of P, up to 0.0020% of N, 0.010 to 0.050% of Ti and the balance iron and inevitable impurities.

4,537,645

MAGNETICALLY TRACEABLE EXPLOSIVES WITH STABILITY AND A METHOD FOR THE PREPARATION THEREOF

Tadashi Yamaguchi; Takayuki Ono; Michitoshi Hirata, and Toshihiko Yokoyama, all of Sendai, Japan, assignors to Tohoku Metal Industries, Ltd., Senadi and Taisei Corporation, Tokyo, both of, Japan

Division of Ser. No. 315,136, Oct. 26, 1981, Pat. No. 4,455,179. This application Dec. 27, 1983, Ser. No. 565,571
Int. Cl.³ C06B *45/18*
U.S. Cl. 149—3 **5 Claims**

1. A magnetically traceable explosive which comprises

(a) an explosive selected from the group consisting of nitric ester explosives, nitrate explosives and perchlorate explosives, and

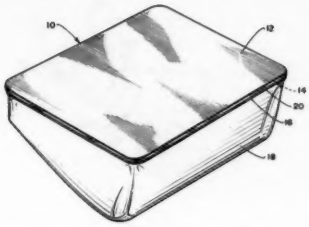
(b) magnetic ferrite powder particles dispersed throughout said explosive, each particle of said ferrite powder having a polymeric material coating thereon, wherein the polymeric material forming the coating on the ferrite particles is a polymer produced by the free radical polymerization of a monomer selected from the group consisting of acrylic and methacrylic acids and esters thereof, vinyl esters of aliphatic carboxylic acids, aromatic vinyl compounds, dienic monomers, acrylonitrile, methacrylonitrile, acrylamide, and methacrylamide, and combinations thereof, and the substrate surface of each particle within said coating being substantially chemically neutral, so that the explosive does not react with particles having defects in the polymeric material coating which permit the explosive to contact the substrate surface.

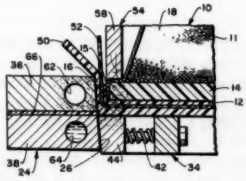
4,537,646

LAP DESK

James E. Hoyle, P.O. Box 606, Fillmore, Calif. 93015

Filed Jun. 10, 1983, Ser. No. 503,383
Int. Cl.³ B32B *3/00;* B29H *7/04;* B29C *17/04;* A47B *97/04*
U.S. Cl. 156—212 **7 Claims**





1. Process for making a lap desk comprising:

securing an edge of a bag which edge surrounds said bag to an edge of a planar board having a face and the edge therearound to create a space between the bag and the board;

filling the space between the bag and board with stuffing material;

adhering a polymeric sheet having a peripheral portion onto the face of the board opposite from the stuffing material-filled bag, thereby creating an assembly, the edge of the sheet extending beyond the edge of the board by a distance not substantially greater than the thickness of the board;

heating the peripheral portion of the sheet to render the sheet bendable over the edge of the board;

moving the assembly in a given direction on a path normal to the plane of the board through a forming die having a die passager slightly larger than the planar periphery of the board;

causing the die to bend and form the peripheral portion of the sheet over and adjacent the edge of the board and the edge of the bag, around the periphery of the board;

completing the moving of the assembly in said given direction through the die.

4,537,647

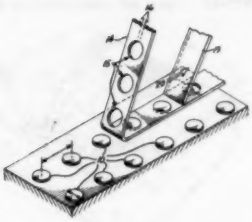
METHOD FOR APPLYING TURBULATORS TO WIND TUNNEL MODELS

Clark B. Foster, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Oct. 6, 1982, Ser. No. 433,189
Int. Cl.³ B29C *19/00;* B32B *31/00;* B28B *3/06;* B05D *1/32*
U.S. Cl. 156—245 **6 Claims**

1. A method for forming turbulators in situ on the surface of a scale model airfoil used in wind tunnel testing, comprising the steps of: forming a mold by applying an adhesive backed tape stencil having a series of circular apertures, to a predetermined location on said airfoil; filling the apertures in said tape

stencil with an epoxy resin; leveling the epoxy resin with the surface of said tape stencil; cure hardening said epoxy resin; removing said tape stencil from said airfoil and leaving in situ formed epoxy disk turbulators on said airfoil; predetermining a



thickness of said tape stencil for substantially producing a height of the epoxy disk turbulators which protrudes into free airstream flow in the wind tunnel during testing of said scale model airfoil for producing a transition point on said airfoil.

4,537,648

AUTOMATIC SPECIMEN SEALING SYSTEM

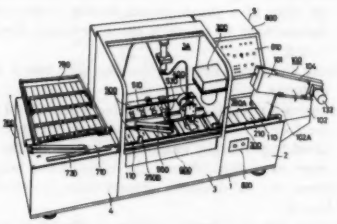
Kouji Shiino; Nobuo Hashimoto; Shozo Wada, all of Tokyo; Keijiro Nakamura; Akio Izumi, both of Kanagawa; Toshio Sato, Kanagawa, and Takashi Matsui, Tokyo, all of Japan, assignors to Sankyo Company Limited and Fuji Electric Company Ltd., both of, Japan

Filed Feb. 28, 1984, Ser. No. 584,289

Claims priority, application Japan, Feb. 28, 1983, 58-30903

Int. Cl.[3] **G01N** *1/28;* **A65C** *9/08*

U.S. Cl. 156—351 **2 Claims**



1. An automatic specimen sealing system comprising:

a conveyor for conveying said glass slides;

a glass slide supplying device for ejecting glass slides sequentially at predetermined time intervals onto said conveyor at a predetermined orientation;

a discriminating device for detecting optically the size of specimens on said glass slides being conveyed on said conveyor;

a pouring device for supplying an adhesive liquid onto said glass slides in an amount determined by the size of the respective specimens;

a glass cover sorting/supplying device for supplying glass covers of a size determined by the size of said specimens to said glass slides conveyed to a supply position on said conveyor;

a binding device for lifting up said glass slides from said supply position to effect sealing of said specimens between said glass slides and said glass covers and then returning again said glass slides to said supply position;

an assemblying device for moving simultaneously a predetermined number of said glass slides having been returned to said supply position and ejected by said conveyor to assemble said slides in a tray; and

a control unit for effecting in synchronization with movement of said conveyor processing of said glass slide supplying device, said discriminating device, said pouring device said glass cover sorting/supplying device, and said sealing device.

4,537,649

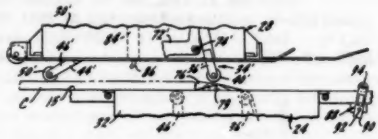
APPARATUS FOR SEALING CARTONS

Lawrence W. Ulrich, and Connie W. Walker, both of Bolingbrook, Ill., assignors to Durable Packaging Corporation, Chicago, Ill.

Filed Jul. 9, 1982, Ser. No. 396,885

Int. Cl.[3] **B65C** *1/04*

U.S. Cl. 156—355 **2 Claims**



1. In an apparatus for applying a strip of sealing tape to seal the bottom flaps of a low profile five panel carton; said carton having a main panel, upstanding side panels of a short dimension hinged to each of the edges of the main panel, and bottom flaps hinged to the opposed edges of each of the side panels; said apparatus comprising: a frame structure defining a generally horizontal carton transporting surface; a tape applying means mounted to said frame structure generally below said transporting surface, said tape applying means includes a bottom leading tape engaging wipe down means for engaging the portion of the strip of tape which is initially applied to a vertical surface of the leading side panel of the carton and which extends across the bottom flaps of the carton; a bottom trailing tape engaging wipe down means for engaging the portion of the strip of tape applied to the vertical surface of the trailing side panel of the carton; a top leading tape engaging wipe down means mounted to said frame structure above said transporting surface for engaging a leading end portion of the strip of tape applied to the top surface of the main panel of the carton adjacent said vertical surface of the leading side panel; a directing means mounted to said frame structure for directing a trailing end portion of the strip of tape onto the top surface of the main panel of the carton adjacent said vertical surface of the trailing side panel, said directing means includes a gas jet means for supplying a blast of pressurized gas onto the trailing end portion of the strip of tape; a control means for sensing the trailing edge of the carton and initiating the blast of pressurized gas and terminating the blast of pressurized gas; and a top trailing tape engaging wipe down means mounted to said frame structure above said transporting surface for engaging said trailing end portion of the strip of tape directed onto said top surface of the main panel of the carton by said directing means.

4,537,650

SHEET BINDING APPARATUS

Robert A. Coons, Jr., Holcomb, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 1, 1984, Ser. No. 606,040

Int. Cl.[3] **B05C** *1/02, 11/105;* **B42C** *9/00*

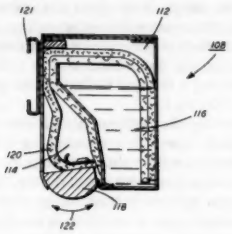
U.S. Cl. 156—384 **14 Claims**

1. An apparatus for adhesively binding together a plurality of sheets to form a bound booklet thereof, including:

means for receiving successive sheets;

an operator replaceable cartridge comprising a housing storing a supply of adhesive threein, a glue applicator blade, in communication with the housing, and being of a length at least equal to the length of the marginal region of the sheet adapted to have glue deposited thereon, and means for extending a portion of the blade from the housing in the operative mode when applying glue to the

sheets and retracting the portion of the blade extending from the housing into the housing in the inoperative mode; and



means for reciprocating the cartridge so that the portion of the blade extending outwardly from the housing thereof contacts the marginal region of successive sheets in said receiving means to apply a strip of glue thereon.

4,537,651

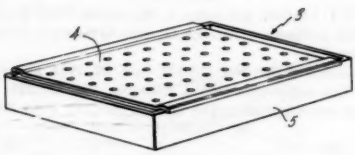
METHOD FOR REMOVING SEMICONDUCTOR LAYERS FROM SALT SUBSTRATES

Alexander J. Shuskus, West Hartford, Conn., and Melvyn E. Cowher, East Brookfield, Mass., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 266,544, May 22, 1981, abandoned. This application Nov. 12, 1982, Ser. No. 441,325

Int. Cl.³ C30B *25/12*

U.S. Cl. 156—613 **7 Claims**



1. A method for removing a semiconductor from an alkali hailde substrate, the alkali halide having a melting point which is less than that of the semiconductor, which consists of:

a. supporting the semiconductor-substrate combination on a support which is wettable by the substrate material, when molten, said support being adapted to attract and remove the substrate material from the semiconductor when the substrate is molten, with the substrate contacting the wettable support;

b. heating the semiconductor-substrate-support combination to a temperature above the melting point of the substrate material but below the melting point of the semiconductor material so that the molten substrate material will be removed from the semiconductor material by capillary action.

4,537,652

PROCESS FOR PREPARING SINGLE CRYSTAL

Akihisa Kawasaki; Kohji Tada; Toshihiro Kotani, all of Osaka, and Shintaro Miyazawa, Isehara, all of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka and Nippon Telegraph & Telephone Public Corp., Tokyo, both of, Japan

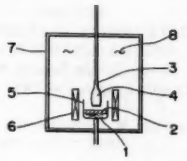
Filed Jun. 5, 1984, Ser. No. 617,563

Claims priority, application Japan, Jun. 10, 1983, 58-104732

Int. Cl.³ C30B *15/00*

U.S. Cl. 156—617 SP **2 Claims**

1. A process for preparing a single crystal comprising pulling up a single crystal by the Czochralski process and cooling it at a temperature not lower than 600° C. at a reduced pressure or in vacuo wherein the cooling step of the pulled single crystal comprises lowering the temperature at a rate of up to 5° C./min. to a temperature higher than 600° C., keeping the same temperature for 1 to 2 hours, reducing the pressure at the same temperature at a rate of up to 60 Kg/cm^2/hr. to 1 to 3 kg/cm^2, keeping the same pressure for 1 to 2 hours, lowering the temperature at the same pressure for 1 to 2 hours, lowering the temperature at the same pressure at a rate of up 5° C./min. to a temperature not lower than 600° C., reducing the pressure at the same temperature at a rate of up to 60 Kg/cm^2/hr. to atmospheric pressure, evacuating at a rate of up to 10 Torr/-min. to a pressure of 10^{-2} Torr. or lower, and keeping the same vacuum for 1 to 2 hours.



4,537,653

SYNTHESIS OF BERYL CRYSTALS

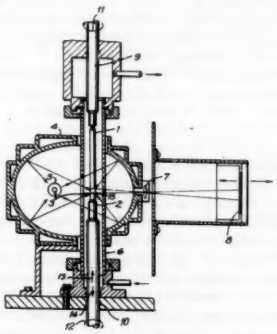
Katsuhiro Teraishi, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Dec. 23, 1982, Ser. No. 452,488

Claims priority, application Japan, Dec. 25, 1981, 56-210438

Int. Cl.³ C30B *13/02*

U.S. Cl. 156—620 **15 Claims**



1. A method of synthesizing beryl single crystals in a zone floating apparatus, comprising:

forming a raw material powder by mixing beryllium oxide (BeO), aluminum oxide (Al_2O_3), silicon dioxide (SiO_2) and chromium oxide (Cr_2O_3) in a molar ratio substantially that of natural beryl, said raw material having the composition, $3BeO.Al_2O_3.6SiO_2.0.005Cr_2O_3$;

sintering the raw material powder and forming a feed rod;

mounting the feed rod on a first rotating axis and rotating the feed rod in a first rotational direction;

forming a flux pellet of raw material powder including at least one material selected from the group consisting of molybdates, vanadates and tungstates;

placing the flux pellet on the free end of the feed rod;

forming a melt zone in the free end of said rotating feed rod;

mounting a seed crystal on a second rotational axis and rotating said axis in a direction opposite to the first rotation direction;

contacting the rotating seed crystal with the melt zone including the flux pellet;

moving the melt zone along the feed rod so that beryl crystal is synthesized as the melt zone is displaced along the feed rod; and

heating said synthetic crystal at a temperature of between about 1000°–1410° C. for about 50 to 500 hours.

4,537,654

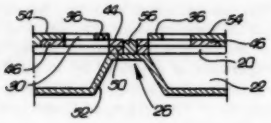
TWO-GATE NON-COPLANAR FET WITH SELF-ALIGNED SOURCE

John J. Berenz, Lawndale, and Kenichi Nakano, North Hollywood, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Dec. 9, 1983, Ser. No. 560,075

Int. Cl.³ H01L *21/306*; B44C *1/22*; C03C *15/00*; C23F *1/02*

U.S. Cl. 156—644 **15 Claims**



1. A method of fabricating a non-coplanar field-effect transistor, comprising the steps of:

forming a stop-etch layer on a semiconductor substrate;

forming an active semiconductive layer on the stop-etch layer;

forming a metallized via hole in the substrate;

locating the via hole from the active layer face of the device;

forming a two-element gate on the active layer and centered in approximate alignment with the via hole;

implanting a source region in the active layer and the stop-etch layer, in an area located between the gate elements;

implanting drain contact regions in the active layer;

etching an opening in the source region, to extend through to the metallized via hole; and

depositing metal in the source region opening to establish good contact with the via hole metallization.

4,537,655

PROCESS FOR PRODUCING AND FLASH DRYING HIGH YIELD MECHANICAL CELLULOSE PULP WITH STEAM AND CONDENSATE RECYCLE

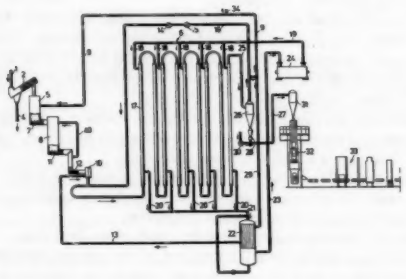
Sven-Erik D. Henriksson, North Vancouver, Canada; Bo A. Ahrel, Frövi, Sweden; Claes G. S. Svensson, Kungälv, Sweden, and Torsten A. H. Franzen, Domsjö, Sweden, assignors to MoDo-Chemetics AB, Ornskoldsvik, Sweden

Filed May 2, 1983, Ser. No. 490,597

Claims priority, application Sweden, May 7, 1982, 8202868

Int. Cl.³ D21C *1/12*, *1/16*

U.S. Cl. 162—23 **7 Claims**



1. A process for inexpensively producing high yield mechanical cellulose pulp having good paper properties, which comprises

(1) preheating particulate lignocellulosic material;

(2) difibrating the preheated material under a steam pressure within the range from about 2 to about 4.5 bar above atmospheric pressure in a disc refiner under conditions such that steam is generated during the defibration;

(3) continuing the defibration until a cellulose pulp is obtained having a freeness within the range from about 300 to about 700 ml CSF;

(4) flash drying the defibrated cellulose pulp in a steam-heated flash dryer while maintaining a superatmospheric steam pressure within the said range during the drying;

(5) withdrawing steam generated during the defibration and passing it in indirect heat exchange with steam utilized in the flash drying, so as to utilize in the drying at least 30% of the heat content thereof; and then

(6) removing and baling the flash-dried cellulose pulp;

(7) separating water vapor produced by evaporation in the steam-heated flash dryer and condensing the water vapor to water;

(8) recycling the water condensate for cooling and dilution to the disc refiner;

(9) vaporizing water condensate from the heating steam of the steam-heated flash dryer converting it to high pressure steam; and then

(10) recycling the steam for heating to the steam-heated flash dryer.

4,537,656

METHOD FOR DELIGNIFYING OR BLEACHING CELLULOSE PULP WHEREIN CHLORINE IS ADDED TO RECY LE LIQUOR TO REGENERATE CHLORINE DIOXIDE

Jonas A. I. Lindahl, and John R. Bergstrom, both of Domsjo, Sweden, assignors to Mo och Domsjo Aktiebolag, Ornskoldsvik, Sweden

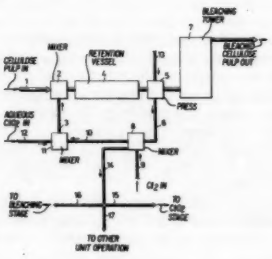
Continuation of Ser. No. 323,323, Nov. 20, 1981, abandoned.

This application Dec. 1, 1983, Ser. No. 557,385

Claims priority, application Sweden, Nov. 27, 1980, 8008337

Int. Cl.³ D21C *9/14*

U.S. Cl. 162—38 **9 Claims**



1. A method for delignifying or bleaching cellulose pulp which comprises in at least one stage adding a liquid containing chlorine dioxide to the cellulose pulp; reacting the cellulose pulp with the chlorine dioxide over a selected period of time; and then decreasing the amount of active chlorine available to the pulp by removing at least a substantial amount of the chlorine by removing a portion of the liquid accompanying the pulp; replenishing active chlorine as chlorine dioxide in the liquid removed from the pulp by regenerating chlorine dioxide in situ by adding chlorine as chlorine only in an amount from 10 to 35% of the amount of active chlorine already present in the liquid; and then recyling the replenished liquid as chlorine dioxide liquor to newly supplied cellulose pulp for delignifying or bleaching the pulp.

4,537,657

WET STRENGTH RESINS

Gerald I. Keim, West Grove, Pa., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 526,304, Aug. 26, 1983, Pat. No. 4,501,862, which is a continuation-in-part of Ser. No. 497,362, May 23, 1983, abandoned. This application Oct. 22, 1984, Ser. No. 663,105

Int. Cl.[3] D21H *3/58*

U.S. Cl. 162—164.3 5 Claims

1. A paper product having wet and dry strength and improved repulpability comprising sheeted cellulose fibers treated with from about 0.2 to about 3% by weight, based on dry weight of fibers, of a water-soluble, cationic thermosetting resin derived by reacting methylbisaminopropylamine with (a) oxalic acid or a lower alkyl diester of oxalic acid and (b) urea to form an aminopolyamide-polyureylene containing tertiary amine groups, the mole ratio of (a) to (b) being from about 0.1:1 to about 10:1 and the mole ratio of methybisaminopropylamine to (a) plus (b) being from 0.9:1 to about 1.2:1 and then reacting the intermediate in aqueous solution with from about 1 mole to about 1.5 moles of epihalohydrin per mole of tertiary amine groups present in said intermediate.

4,537,658

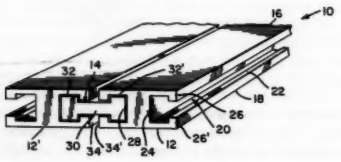
PAPERMAKERS FABRIC CONSTRUCTED OF EXTRUDED SLOTTED ELEMENTS

Hans Albert, Vienna, Austria, assignor to Scapa Inc., Waycross, Ga.

Filed Sep. 30, 1982, Ser. No. 429,154

Int. Cl.[3] D21F *1/10*

U.S. Cl. 162—348 14 Claims



1. A papermakers fabric comprising:

a plurality of formed elongated elements of generally rectangular cross section having a length commensurate with the width of the desired fabric, said elements being positioned with their longitudinal axes oriented in the cross-machine direction and having substantially parallel flat upper and lowe surfaces,

a first slot formed in and extending completely along at least one longitudinal edge of each of said elements, a second slot formed in and extending completely along another longitudinal edge of each of said elements, said element being formed with equivalently dimensioned slots on two opposite sides thereof,

a first aperture pattern formed in and extending through the upper and lower surfaces of said elements to provide a given permeability of the fabric,

connecting means for linking said plurality of elements one next to the other by means of said slots to form either an endless or an open ended fabric as required, said connecting means including a pintle formed to fit into said slots and thereby join adjacent formed elements, wherein the linked elements form a smooth papermaking fabric with no protrusions on either the upper or lower surfaces thereof and with no substantial gaps between the elements.

4,537,659

SUPPORTING BEAM FOR A FOIL IN A PAPER MACHINE

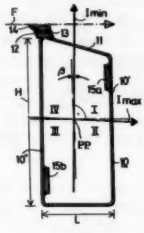
Erkki Koski, Jyviskylii, Finland, assignor to Valmet Oy, Finland

Filed Oct. 25, 1982, Ser. No. 436,403

Claims priority, application Finland, Oct. 28, 1981, 813368

Int. Cl.[3] D21C *1/48;* D21G *7/00, 9/00*

U.S. Cl. 162—352 9 Claims



1. In an assembly including a paper machine foil having a forward leading edge and a rearward trailing edge, a supporting beam for said paper machine foil, and over which foil a paper machine wire passes in a direction from said forward leading edge of said foil towards said rearward trailing edge thereof, said beam being constituted by a box-type beam extending in a substantially horizontal cross-machine direction during operation and having a height H in the range of about 1.3 to 2.5 times the breadth L of said beam, said beam having forward and rearward side walls, the improvement comprising the combination wherein:

said forward and rearward side walls of said supporting beam are situated in planes which are substantially perpendicular to the direction of wire run over said foil;

said foil is situated in a region situated substantially vertically above said forward side wall of said supporting beam; and

with reference to forward and rearward upper quadrants and forward and rearward lower quadrants of the interior of said box-type beam, first and second stiffener means extending substantially parallel to the longitudinal axis of said beam for inclining the principal axes of inertia of said beam at a small positive angle to the vertical and horizontal planes passing through the center of gravity of said beam relative to the direction of the run of the paper machine wire passing over said foil, said first stiffener means being disposed in said rearward upper quadrant of the beam interior and said second stiffener means being disposed in said forward lower quadrant of the beam interior, whereby vibrations of said beam caused by friction forces between said foil and the wire passing thereover are reduced.

4,537,660

VAPOR GENERATING AND RECOVERING APPARATUS

James W. McCord, 9101 Nottingham Pkwy., Louisville, Ky. 40222

Continuation-in-part of Ser. No. 919,978, Jun. 28, 1978, abandoned. This application Mar. 8, 1982, Ser. No. 355,668

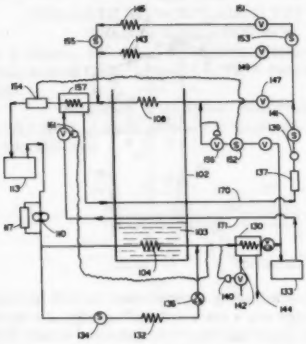
Int. Cl.[3] B01D *3/02;* F25B *41/00*

U.S. Cl. 202—170 41 Claims

1. In a vapor generating and recovery apparatus for vaporizing a liquid and condensing a vapor, including a housing comprising at least one compartment therein, said compartment having a liquid therein, the improvement comprising:

heating and cooling system in heat transfer relation with said liquid and said vapor in said compartment, said system including a main condenser in heat emitting relation with said liquid; a main evaporator in heat absorbing relation

with said vapor; a complementary condenser in heat emitting relation in said system disposed outside said compartment; and, means to compress a refrigerant flowing in said system, said means to compress being in fluid communication on its high pressure side with said main condenser and said complementary condenser, and on its low pressure side with said main evaporator, said system including expansion means disposed between said main condenser and said main evaporator, pump down valve means



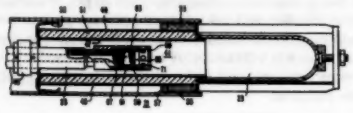
therein disposed downstream of said main condenser and upstream of said main evaporator selectively closed prior to the shut down of the compressor and remains closed during system pump down while simultaneously said means to compress continues to operate for pumping refrigerant out of said compressor, and means to de-activate said means to compress at preselected refrigerant conditions said means to de-activate being operatively connected to said means to compress.

4,537,661

TECHNIQUE FOR MONITORING THE OXIDATION/REDUCTION POTENTIAL CHARACTERISTICS OF A STEAM ENVIRONMENT

Pang K. Lee, Murrysville, and William M. Hickam, Churchill Borough, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 24, 1984, Ser. No. 613,832
Int. Cl.[3] G01N *27/46*
U.S. Cl. 204—1 T **5 Claims**



1. A method of operating a solid electrolyte electrochemical cell assembly in a steam environment for the purpose of monitoring the oxidation/reduction potential of the environment, said solid electrolyte electrochemical cell assembly being of the type in which the solid electrolyte electrochemical cell is a solid electrolyte member having a first electrode disposed in contact with a first surface of the solid electrolyte member and a second electrode disposed in contract with the opposite surface of the solid electrolyte member, the solid electrolyte member is disposed in the cell assembly such that the first surface of the solid electrolyte member is exposed to a reference gas and the opposite surface of the solid electrolyte member is exposed to an environment of interest such that an electrical signal reflecting the gas partial press is generated, and the cell assembly includes heating means operatively associated therewith for effecting the controllable heating of the solid electrolyte member, said operational method comprising the steps of:

disposing the cell assembly in a steam environment such that the second surface of the solid electrolyte member is in communication with the steam environment,

providing a reference gas of determinable content in communication with the first surface of the solid electrolyte member,

heating the solid electrolyte member by means of said heating means operatively associated therewith to a temperature of about 500° C. at which low concentration levels of oxygen and hydrogen are distinguished from one another, and

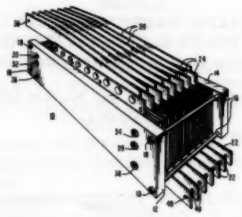
measuring the electrical signal generated by the solid electrolyte member as a function of the oxygen or hydrogen content in the steam environment.

4,537,662

METHOD OF ELECTRICALLY SHORTING AN ELECTROLYTIC CELL

Robert M. Hruda, Horseheads, N.Y., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 4, 1984, Ser. No. 607,098
Int. Cl.[3] C25G *15/02*
U.S. Cl. 204—1 R **6 Claims**



1. A method for electrically shorting an electrolytic cell from a system comprised of a series of electrolytic cells, said cells each having conductor bars of a first polarity disposed along a top surface of the cell and conductor bars of a second polarity disposed along a bottom surface of the cell, said cells in the system being electrically connected in a series circuit relationship by bus bars connecting the conductor bars of the second type polarity on one cell to the conductor bars of the first type polarity on the adjacent cell, said method comprising disposing a jumper circuit adjacent a first cell, said first cell to be electrically shorted from the system, and a second cell, said cell being adjacent to said first cell, said second cell being electrically connected to said first cell by the bus bars electrically connected to the conductor bars of said second polarity of said second cell and conductor bars of said first polarity of said first cell, said jumper circuit being comprised of a first bus bar and a second bus bar, said first and second bus bars being connected electrically in series by a switch, electrically connecting the conductor bar of said first polarity of said second cell to said second bus bar of said jumper circuit, electrically connecting the conductor bar of said first polarity of a third cell to said first bus bar of said jumper circuit, said third cell being disposed adjacent to said first cell on the side of said first cell opposite to said second cell, closing the switch of the jumper circuit whereby said first and second cells are electrically shorted from said system, disconnecting at said first cell the bus bar connected between the conductor bar of said second polarity of said second cell and the conductor bar of said first polarity of said first cell, disconnecting at said first cell the bus bar connected between the conductor bar of said second polarity of said first cell and the conductor bar of said first polarity of said third cell, physically connecting the bus bar

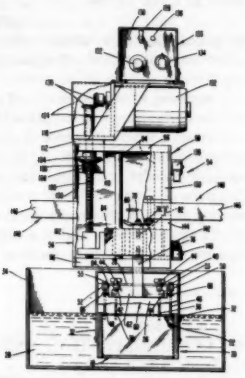
which was disconnected from the conductor bar, of said first polarity, of the first cell to a terminal of the switch in the jumper circuit and opening the switch in the jumper circuit.

4,537,663

METHOD OF AND APPARATUS FOR PLATING USING CONTROLLED PROGRESSIVE IMMERSION

David I. Macdonald, Revere, Mass., assignor to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Jul. 27, 1982, Ser. No. 402,406
Int. Cl.³ C25D *5/04, 17/00, 17/06*
U.S. Cl. 204—14.1 **10 Claims**



1. A method of plating an essentially uniform thickness of an electrically conductive material onto an electrically conductive portion of an article, which comprises the steps of:

supporting the article above an electroplating bath containing the electrically conductive material such that a lower end of the electrically conductive portion of the article is adjacent the electroplating bath;

electrically contacting the electrically conductive portion of the article adjacent only an upper end thereof to apply electrical plating potential to the article portion; and

progressively immersing the article portion, lower end first, at a preselected rate into the electroplating bath as the electrical plating potential to being applied to the article portion, such that successive sections of the article portion between the upper and lower ends thereof are continuously immersed in the electroplating bath for progressively increasing time periods, with the lower end of the article portion being continuously immersed in the electroplating bath for the longest time period and the upper end of the article portion being continuously immersed in the electroplating bath for the shortest time period, respectively, to form a layer of the electrically conductive material of an essentially uniform thickness on the article portion.

6. Apparatus for plating an essentially uniform thickness of an electrically conductive material on an electrically conductive portion of an article, which comprises:

an anode;

means for mounting the anode and the electrically conductive portion of the article in spaced opposed relationship above an electroplating bath containing the electrically conductive material such that lower ends of the article portion and the anode are adjacent the electroplating bath;

means for electrically contacting the electrically conductive portion of the article and the anode adjacent only upper ends of the article portion and the anode, to apply electrical plating potential across the article portion and the anode;

drive means for lowering the mounting means and progressively immersing the article portion and the anode, lower ends first, at a preselected rate into the electroplating bath simultaneously as the plating potential is being applied across the article portion and the anode, such that successive sections of the article portion between the upper and lower ends thereof are continuously immersed in the electroplating bath for progressively increasing time periods, with the lower end of the article portion being continuously immersed in the electroplating bath for the longest time period and the upper end of the article portion being continuously immersed in the electroplating bath for the shortest time period, respectively, to form a layer of the electrically conductive material of an essentially uniform thickness on the article portion; and

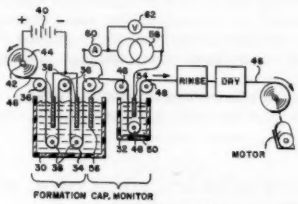
means responsive to the lowering of the mounting means for de-energizing the drive means when the article portion has become fully immersed in the electroplating bath.

4,537,664

METHOD FOR CONTINUOUSLY MONITORING OXIDE THICKNESS ON MOVING ALUMINUM FOIL

William G. Novacek, Clinton, Tenn., assignor to Sprague Electric Company, North Adams, Mass.

Filed Apr. 6, 1984, Ser. No. 597,300
Int. Cl.³ C25D *11/04*
U.S. Cl. 204—28 **7 Claims**



5. A method for continously monitoring the thickness of the oxide that is being formed on an aluminum electrolytic capacitor foil comprising:

(a) drawing a bare aluminum capacitor foil through a formation machine including an energized formation tank containing a formation electrolyte and continuously forming therein an aluminum oxide film over said foil;

(b) drawing said formed foil through a second electrolyte contained in a second tank, an AC voltage source being connected between a first electrode immersed in said formation electrolyte and a second electrode immersed in said second electrolyte;

(c) separating from the current flowing through said AC source, the leading reactive component relative to said AC voltage; and

(d) monitoring said reactive current whereby the ratio of said AC voltage to said reactive current is a direct measure of the thickness of said oxide film.

4,537,665

PRODUCTION OF ALUMINUM FOIL CAPACITOR ELECTRODES

Trung H. Nguyen, Williamstown, Mass., and Clinton E. Hutchins, Pownal, Vt., assignors to Sprague Electric Company, North Adams, Mass.

Filed Sep. 4, 1984, Ser. No. 646,776
Int. Cl.³ C25D *11/10, 11/12, 11/16*
U.S. Cl. 204—29 **7 Claims**

1. In the manufacture of low-voltage aluminum foil electrolytic capacitor electrodes including etching said foil, cleaning it, and anodizing said foil, the improvement comprising ther-

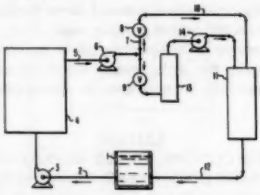
mal treating said cleaned foil at about 595° to 650° C. and then anodizing said treated foil in an adipate formation electrolyte.

4,537,666

DECONTAMINATION USING ELECTROLYSIS

Alexander P. Murray, Murrysville, and Thomas S. Snyder, Wilkins Township, Allegheny County, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 1, 1984, Ser. No. 585,062
Int. Cl.[3] C25F 3/02
U.S. Cl. 204—129.95 6 Claims



1. A method of decontaminating metal surfaces having a radioactive coating thereon which contains metal ions including ferric ions, comprising:

(A) passing an aqueous decontamination solution containing at least one chelate for said metal ions over said coating to solubilize said metal ions, including said ferric ions;

(B) passing said aqueous decontamination solution through a porous DC electrode to reduce said ferric ions to ferrous ions; and

(C) passing said aqueous decontamination solution containing said ferrous ions over said coating.

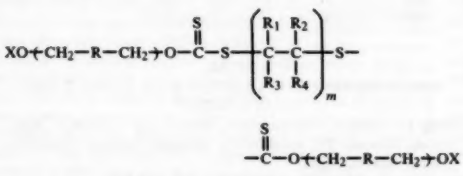
4,537,667

RADIATION-CURABLE COPOLYMERS OF MONOETHYLENIC MONOMERS

Timothy E. Bishop, Arlington Heights; George Pasternack, Lincolnshire, and John M. Zimmerman, Mount Prospect, all of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Apr. 25, 1984, Ser. No. 603,836
Int. Cl.[3] C08F 8/00
U.S. Cl. 204—159.15 13 Claims

1. A radiation-curable linear addition polymer or copolymer having a weight average molecular weight of from about 1,500 to about 15,000 of polymerized monoethylenically unsaturated monomers, which may include up to 25% by weight of an hydroxy-functional monomer, and which carries an hydroxyl group at most of its ends, reacted with a monoethylenically unsaturated monomer carrying a single functional group reactive with the hydroxyl group, so that the polymer carries monoethylenically unsaturated groups bonded to an average of from 1.6 to 5 of the hydroxyl groups per polymer molecule, said polymer having the structure:



where R is an organic radical free of reactive groups, R1, R2, R3 and R4 are the remaining groups in the monoethylenic monomers which were polymerized, or hydrogen, n is the number of repeating units in the polymer providing the said molecular weight, and X is the residue of a monoethylenically unsaturated monomer having a single hydroxy-reactive functional group.

4,537,668

PROCESS FOR THE PRODUCTION OF A CATION EXCHANGE DIAPHRAGM AND THE DIAPHRAGM OBTAINED BY THIS PROCESS

Gilbert Gaussens, Meudon, and Francis Lemaire, Chatillon Sous Bagneux, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jun. 10, 1981, Ser. No. 272,206
Claims priority, application France, Jun. 24, 1980, 80 13939
Int. Cl.[3] C25B 13/08
U.S. Cl. 204—159.17 19 Claims

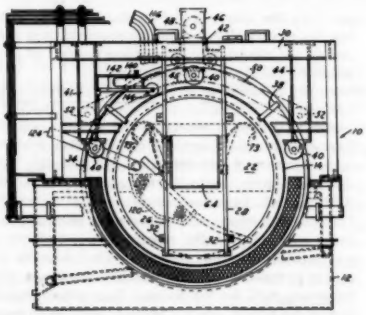
1. A process for the production of a cation exchange diaphragm, wherein in a first stage of grafted copolymer powder is prepared by grafting styrene and/or its derivatives onto a polyethylene powder by exposing a suspension of said polyethylene and styrene and/or its derivatives to irradiation by means of ionizing rays so as to obtain a grafting degree of the monomers on the polyethylene polymer of 15 to 60%, in a second stage the grafted copolymer powder is brought into the form of a thin film by dissolving the grafted copolymer powder in an organic solvent, by pouring the thus obtained solution onto a support and then evaporating the solvent and in a third stage cation exchanger groups are fixed to the thus obtained grafted copolymer film.

4,537,669

APPARATUS FOR CLEANING, PLATING AND/OR COATING ARTICLES

Robert McInnes, 4444 W. Bristol Rd., Flint, Mich. 48507

Filed Apr. 6, 1984, Ser. No. 600,795
Int. Cl.[3] B08B 3/06; B65G 49/02; C25D 17/20
U.S. Cl. 204—201 28 Claims



1. In an apparatus for cleaning, plating and/or coating articles, the combination comprising

a container adapted to contain a liquid treatment material,

a barrel adapted to be at least partially submerged in liquid in said container,

said barrel having a longitudinal axis,

means for rotatably supporting said barrel so that it is partially submerged in liquid in said container,

said barrel having a plurality of circumferentially spaced baffles on the inner periphery thereof, said baffles extending radially inwardly and forming an acute angle with said inner periphery such that when said barrel is rotated in one direction, said baffles agitate the articles, and when said barrel is rotated in the opposite direction, said baffles elevate the articles and cause them to drop,

laterally spaced stationary end walls mounted in fixed positions covering the ends of said barrel,

and chute means extending from the interior of said barrel adjacent one end wall through an opening in the other end wall such as to receive articles dropped by the baffles by gravity and discharge them from the barrel.

4,537,670

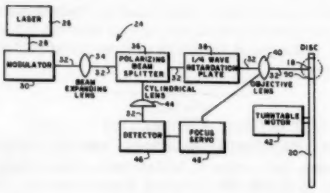
APPARATUS FOR MAKING A STAMPING MASTER FOR VIDEO DISK REPLICATION

David A. Strand, West Bloomfield, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Division of Ser. No. 383,176, May 28, 1982, abandoned. This application Apr. 25, 1984, Ser. No. 603,618

Int. Cl.³ C25D *17/00;* **B05D** *5/06;* **B32B** *3/02*

U.S. Cl. 204—224 R **33 Claims**



1. An apparatus for making a stamping master to facilitate video disk replication comprising:

(a) thin film deposition means for depositing a thin film of material over a substrate, said material being reversibly convertible at least twice between a first state and a second state, said means depositing said film in one of said states;

(b) converting means for converting selected areas of said film from one of said states to the other said state in a predetermined pattern;

(c) means for depositing at least one additional material onto at least a portion of the areas of said film corresponding to one of said states;

(d) means for forming a continuous backing layer over at least part of said additional material; and

(e) means for separating said backing layer and said additional material from said film, said backing layer and said additional material forming a first stamping master.

4,537,671

CATHODE POT OF AN ALUMINUM REDUCTION CELL

Max Zollinger, Wädenswil, and Raoul Jemec, Benglen, both of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

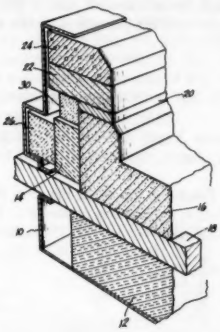
Filed Jul. 6, 1983, Ser. No. 511,266

Claims priority, application Switzerland, Jul. 12, 1982, 4249/82

Int. Cl.³ C25C *3/08, 17/00;* **C25B** *11/12*

U.S. Cl. 204—243 R **17 Claims**

1. A cathode pot of a fused salt reduction cell comprising an outer steel shell, a thermally insulating layer and an inner lining made of carbon, the improvement comprising a low shear strength electrolyte resistant layer which runs horizontally around the cell and exclusively arranged at the level of the electrolyte to which it is resistant for dividing the carbon lining into a lower part and an upper part such that the electric field in the cell runs through the lower part of said carbon lining thereby resulting in swelling of the lower part of said carbon lining to a greater degree than said upper part of the carbon lining wherein the resultant stresses due to the swelling are accommodated by the fracturing of said low shear strength elctrolyte resistant layer wherein said layer is formed of a material characterized by the ability to withstand temperatures



up to 1000° C. and a shear strength significantly lower than that of the carbon lining.

4,537,672

ELECTROLYTIC CELL

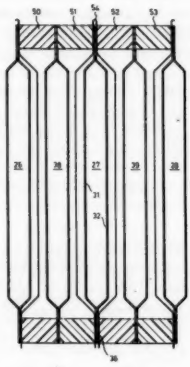
Colin Brereton, Middlewich, England, assignor to Imperial Chemical Industries, PLC, England

Filed Jan. 26, 1984, Ser. No. 574,245

Claims priority, application United Kingdom, Feb. 9, 1983, 8303586

Int. Cl.³ C25B *13/08, 9/00, 11/04*

U.S. Cl. 204—253 **9 Claims**



1. An electrolytic cell positioned in a vertical mode and comprising a plurality of anodes each having an active anode area and a plurality of cathodes each having an active cathode area, and a substantially hydraulically impermeable cation-exchange membrane and a gasket of an electrically insulating material positioned between each adjacent anode and cathode to form in the cell a plurality of separate anode and cathode compartments, characterised in that either

(a) the cation-exchange membrane is in contact with the anode at least around the periphery of the anode, is positioned on both sides of the anode, and is in the form of a film draped over the top of the anode, and in that the gasket is positioned between the membrane and the cathode and abuts onto that part of the membrane which is in contact with the periphery of the anode, or

(b) the cation-exchange membrane is in contact with the cathode at least around the periphery of the cathode, is

positioned on both sides of the cathode, and is in the form of a film draped over the top of the cathode, and in that the gasket is positioned between the membrane and the anode and abuts onto that part of the membrane which is in contact with the periphery of the cathode.

4,537,673

ELECTROLYTIC CELL

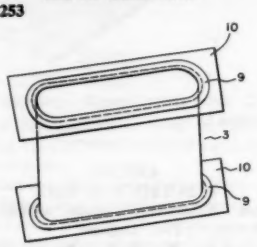
Tatsuro Asawa; Yasuo Sajima, and Junjiro Iwamoto, all of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo

Filed Jul. 12, 1982, Ser. No. 397,177

Claims priority, application Japan, Jul. 14, 1981, 56-108840; Jul. 14, 1981, 56-108841; Jul. 21, 1981, 56-112973

Int. Cl.³ C25B *13/02*

U.S. Cl. 204—253 **9 Claims**



1. In an electrolytic cell comprising intercalated finger-shaped electrodes each disposed through a cation exchange membrane, the improvement comprising that said cation exchange membrane constitutes a cylinder or envelope enclosing a finger-shaped anode or cathode which has a flare formed at one end or each end of the cylinder or at the open end of the envelope, said flare having a width of from 10 to 15 mm and being joined with a flange to form a unitary cation exchange membrane-flange structure with liquid-tightly divides an anode compartment from a cathode compartment of said cell.

4,537,674

ELECTROLYTIC CELL ANODE

Stanford R. Ovshinsky, Bloomfield Hills; Krishna Sapru, Troy, and Gao Liang, Detroit, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Jul. 19, 1982, Ser. No. 399,878

Int. Cl.³ C25B *11/00*; C25C *15/00*

U.S. Cl. 204—290 R **20 Claims**

1. A multicomponent compositionally disordered catalytic material for use as an anode catalyst in an electrolytic cell comprising:

a host element having at least one transition element,

said host matrix having incorporated therein one or more modifier elements, said modifier element selected from a group consisting of Co, Ni, Sr, Li, K, In, Sn, C, Mn, Ru and Al, said modifier element modifying the local structural and chemical environments throughout the bulk of said material to provide the disorder and create an increased density of catalytically active sites for oxygen gas evolution in an electrolytic cell, said material having at least one amorphous phase, microcrystalline phase, polycrystalline phase lacking long-range compositional order, or any combination of these phases.

5. The catalytic material as defined in claim 1 wherein said catalytic material forms at least part of a cathode for an electrolytic cell.

4,537,675

UPGRADED SOLVENTS IN COAL LIQUEFACTION PROCESSES

Howard F. Silver, and Ronald L. Miller, both of Laramie, Wyo., assignors to In-Situ, Inc., Laramie, Wyo.

Filed May 13, 1982, Ser. No. 377,791

Int. Cl.³ C10G *1/00, 1/06*

U.S. Cl. 208—8 LE **15 Claims**

1. In a coal liquefaction process wherein a slurry of feed coal and a solvent are introduced into a coal liquefaction zone wherein coal dissolution and hydrogen transfer to the coal fragments formed in dissolution are accomplished by heating the slurry in the presence of molecular hydrogen, the improvement comprising using as a hydrogen donor material in the solvent, coal-derived, pyridine-soluble, bottoms consisting essentially of oils, asphaltenes and preasphaltenes boiling above about 800° F. to about 1000° F., containing no more than about 50 weight percent benzene-insoluble material, all of which bottoms have been hydrotreated in a hydrotreater under mild conditions sufficient to add to said bottoms a controlled amount of hydrogen in the range of from about 0.05 to about 2.0 weight percent.

4,537,676

REDUCING METAL CONTENT OF OIL FEEDS

Roby Bearden, and Gordon F. Stuntz, both of Baton Rouge, La., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 221,844, Dec. 31, 1980, abandoned. This application Jan. 4, 1982, Ser. No. 336,785

Int. Cl.³ C10G *17/06, 29/10*

U.S. Cl. 208—251 R **16 Claims**

1. A method for reducing the metal contaminant concentration in distillate derived by processing a bottoms fraction from an atmospheric separation where the bottoms fraction contains metal contaminant, said method comprising:

A. passing the bottoms fraction into a contacting zone maintained at a temperature ranging between about 200° C. and about 450° C. and contacting the bottoms fraction therein with one or more metal devolatilization agents selected from the group consisting of vapor phase sulfur dioxide and precursors of vapor phase sulfur dioxide so that the concentration of sulfur dioxide in the contacting zone ranges from about 0.5 to about 5.0 wt.% of the bottoms fraction; and

B. passing the bottoms fraction from the contacting zone into a vacuum separation zone wherein the bottoms fraction containing the metal contaminant is separated into a distillate having a relatively low metal contaminant concentration and a bottoms having a relatively high metal contaminant concentration.

4,537,677

OIL EMULSIONS OF FLUOROSILICONE FLUIDS

Joseph W. Keil, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Nov. 5, 1984, Ser. No. 668,048

Int. Cl.³ C10M *1/18, 1/28, 1/30*

U.S. Cl. 208—370 **27 Claims**

1. An emulsion comprising, in combination:

(A) from 0.5 to 90 parts by weight of a fluorosilicone fluid having the average formula

$$R_2''R'SiO(RR''SiO)_xSiR_2''R'$$

wherein

R is a fluoroalkyl radical having the general formula

$$(C_mF_{2m+1})(CH_2CH_2)_y,$$

m having an average value of 1, 2, 3, or 4,

y having a value of 1, 2, or 3,

wherein in said average formula for the fluorosilicone fluid

x has a value of from 5 to 100,

R'' is a monovalent hydrocarbon radical, and

R' is selected from the group consisting of OH radicals, R'' radicals, and R radicals,

(B) from 0.1 to 25 parts by weight of a block copolymer selected from the group consisting of polydimethylsiloxane-polybutadiene block copolymers and polydimethylsiloxane-polybutadiene block copolymers in which the polybutadiene block has been wholly or partially hydrogenated; and

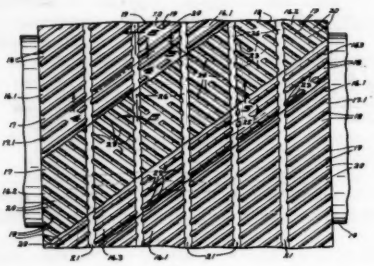
(C) from 9 to 89 parts by weight of mineral oil.

4,537,678

ROTARY BIOLOGICAL CONTACTOR

Christopher P. Thissen, Austin, Minn., assignor to Walker Process Corporation, Aurora, Ill.

Filed Oct. 4, 1984, Ser. No. 657,507
Int. Cl.³ C02F *3/08*
U.S. Cl. 210—150 **19 Claims**



1. A rotary biological contactor to be partially immersed in a tank of waste water being processed, comprising

mounting means including a rigid central core to accommodate locating the contactor in the tank, and

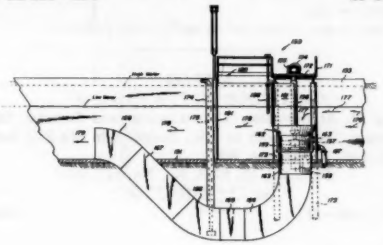
a cylindrical waste water treating module upon which biological slimes and biomass are established, the module being affixed on the central core and including a multiplicity of circumferential turns of stiff sheet plastic one within the other and having substantially aligned edges defining the ends of the module, the sheet plastic in the turns having a multiplicity of elongate undulations forming elongate ridges and valleys extending obliquely of said edges, adjacent turns of the sheet plastic having the elongate undulations extending transversely of each other, the ridges in the sheet plastic having crests welded to the next adjacent turn of the sheet plastic and preventing deformation of the module along and around the rotation axis and maintaining uniform and constant spacing in a radial direction, the undulations forming a multiplicity of intersecting flow channels extending to the ends of the module for establishing numerous diverse routes for flow of water and air and alternate filling and purging of the channels in each revolution in the tank, the alternate filling and purging of the flow channels causing mixing, turbulence, and changes of velocity of the water and continued shearing of excess biomass from the sheet plastic.

4,537,679

CONSERVATION OF MOMENTUM IN A BARRIER OXIDATION DITCH

John H. Reid, 7 Stansbury Ct., Fredericksburg, Va. 22401

Division of Ser. No. 282,592, Jul. 13, 1981, which is a division of Ser. No. 28,383, Apr. 9, 1979, Pat. No. 4,278,547, which is a continuation-in-part of Ser. No. 848,705, Nov. 4, 1977, abandoned, which is a continuation-in-part of Ser. No. 649,995, Jan. 19, 1976, abandoned. This application Sep. 30, 1982, Ser. No. 431,302
Int. Cl.³ C02F *3/20*
U.S. Cl. 210—194 **10 Claims**



1. A mixing-control apparatus which comprises, in combination with an endless channel of a closed-circuit oxidation ditch:

(a) a barrier, sealably attached to the bottom and sides of said channel, for dividing said channel into an intake channel portion and a discharge channel portion, said barrier having at least one aperture therethrough for providing substantially translational fluid flow communication between said intake channel and said discharge channel, thereby conserving momentum of fluid flowing is said channel by enabling induced fluid-flow therebetween;

(b) means for adjustably opening and closing said at least one aperture; and

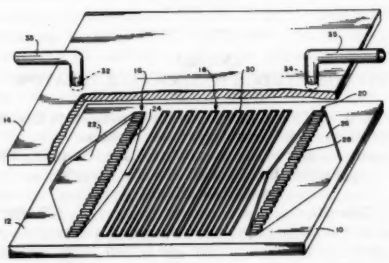
(c) at least one pump assembly which comprises a motor having a shaft, an impeller attached to said shaft, and a discharge duct within which said impeller operates and which has an intake end and a discharge end, said intake end being within said intake channel portion and said discharge end being within said discharge channel portion thereby enabling a pumped fluid-flow therebetween.

4,537,680

INTEGRAL FLUID FILTER AND CAPILLARY

Phillip W. Barth, Palo Alto, Calif., assignor to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Jun. 4, 1984, Ser. No. 616,658
Int. Cl.³ B01D *31/00*
U.S. Cl. 210—316 **6 Claims**



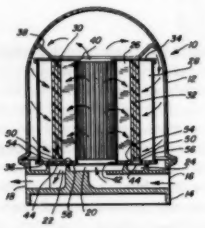
1. An integral filter and capillary comprising

a substrate having a major surface,
a first recessed region on said surface and in said substrate including a first plurality of generally parallel grooves,
a second groove on said surface and in said substrate connected with said first recessed region adjacent to one end of said first plurality of grooves, said second groove having cross-sectional dimensions greater than the cross-sectional dimensions of said first plurality of grooves,
a cover affixed to said major surface and covering said first recessed region and said second groove,
a fluid input to said first recessed region adjacent to one end of said first plurality of grooves opposite from said second groove, and
a fluid output connected to said second groove.

4,537,681
CARTRIDGE FILTER END CAP

George D. Argiropoulos, Lake Geneva, and Somchai Sahachaisere, Darien, both of Wis., assignors to Sta-Rite Industries, Inc., Milwaukee, Wis.

Filed Jul. 11, 1983, Ser. No. 512,223
Int. Cl.³ B01D *27/06*
U.S. Cl. 210—317 **4 Claims**



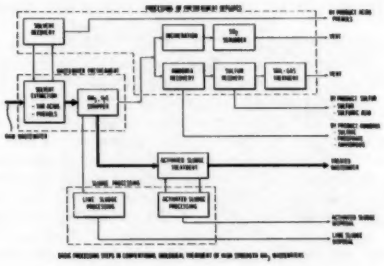
1. A fluid filter assembly, comprising:
a housing including means defining an inlet and an outlet,
a fluid filter cartridge mounted in said housing, said cartridge including first and second end caps, first and second tubular filter media concentrically mounted between said first and second end caps, said first and second filter media spaced apart to define a gap therebetween,
said first end cap including means defining an outlet in fluid communication with said housing outlet, said outlet in said end cap being in alignment with said gap, and
a reinforcing member in said first end cap surrounding said outlet in said first end cap, said reinforcing member including first and second inclined ends, wherein said first end cap outlet is annular, said reinforcing member is annular and includes means defining a plurality of openings in fluid communication with said outlet in said first end cap, and radial rib members on said reinforcing member adjacent each said opening, a space defined between adjacent rib members, at least a portion of said first and second filter media located in said space.

4,537,682
ACTIVATED SLUDGE WASTEWATER TREATING PROCESS

George M. Wong-Chong, Allison Park, Pa., assignor to Environmental Research & Technology, Concord, Mass.

Continuation-in-part of Ser. No. 344,165, Jan. 29, 1982,. This application Jan. 21, 1983, Ser. No. 460,090
Int. Cl.³ C02F *3/12*
U.S. Cl. 210—611 **128 Claims**

1. An activated sludge process for treating wastewater containing ammonia as a contaminant and further other wastewater contaminants, if present, including cyanide, thiocyanate, sulfide and/or organic materials, to achieve substantially complete nitrification of said ammonia into nitrite and/or nitrate and substantially complete denitrification of said nitrite and/or nitrate into free nitrogen, said process comprising
microbially treating the wastewater in an activated sludge process in the presence of a microorganism population acclimated to the wastewater contaminants and their levels in the wastewater and including
nitrifying microorganisms capable of converting ammonia to nitrite,
optionally, nitrifying microorganisms capable of converting nitrite to nitrate, and
facultative microorganisms capable of denitrifying nitrite and/or nitrate by oxidizing organic material and converting nitrite and/or nitrate to free nitrogen,
under the following conditions:
(1) controlling the sludge wastage rate to the extent that, for the wastewater fed during the treatment and at the conditions at which the treatment is operated, the sludge wastage rate
(i) is low enough to provide and maintain a steady state population of microorganisms capable of converting ammonia to nitrite and/or nitrate and yet
(ii) is high enough to prevent buildup of inert solids in the sludge;
(2) controlling the hydraulic residence time of the wastewater in treatment such that the hydraulic residence time is
(i) long enough to produce a sludge concentration that can be water/solid separated at the sludge wastage rate of (1) above, and



(ii) long enough to achieve substantially full sludge performance;
(3) maintaining a dissolved oxygen level on a continuous or weighted average basis,
(i) sufficiently high that microbial conversion of ammonia to nitrite and/or nitrate occurs but
(ii) lower than the dissolved oxygen level at which microbial conversion of nitrite and/or nitrate to free nitrogen ceases to occur;
(4) mixing the sludge
(i) to the extent that the sludge mixing rate achieves utilization of sludge present during treatment so as to avoid causing a sludge growth rate which would result in exceeding the maximum allowable sludge wastage rate of (1) above, and
(ii) to the extent that the sludge mixing rate is large enough to reduce gradients in levels of bulk dissolved oxygen to a level consistent with the denitrification desired for the wastewater treatment, yet
(iii) to the extent that the sludge mixing rate is below the rate at which microbial cell rupture occurs, irreversible breakup of agglomerates of sludge occurs, and/or sludge/water settleability characteristics are not deteriorated;
(5) controlling the biological oxygen demand during treatment such that at least the stoichiometric amount of biological oxygen demand required to achieve denitrification by microbial conversion of nitrite and/or nitrate

to free nitrogen during treatment at a particular concentration of ammonia in the wastewater fed for treatment is present;

(6) controlling the pH of the treatment

(i) in a range in which the level of free ammonia inhibitory to microorganism activity during the treatment is avoided, and

(ii) in a range in which the level of free nitrous acid inhibitory to microorganism activity during treatment is avoided, yet

(iii) in a hospitable range for microorganism growth and effective waste treatment of waste in the wastewater; and

(7) controlling the temperature of the treatment

(i) in a range in which the level of free ammonia inhibitory to microorganism activity during the treatment is avoided, and

(ii) in a range in which the level of free nitrous acid inhibitory to microorganism activity during the treatment is avoided, yet

(iii) in a hospitable range for microorganism action on and effective treatment of the waste in the wastewater.

69. A process for producing an acclimated population of microorganisms for treating wastewater containing ammonia as a contaminant, and further other contaminants, if present, including cyanide, thiocyanate, sulfide and/or organic materials, to achieve substantially complete nitrification of said ammonia into nitrite and/or nitrate and substantially complete denitrification of said nitrite and/or nitrate into free nitrogen, said process comprising introducing the wastewater into an activated sludge process containing a microorganism population including

nitrifying microorganisms capable of converting ammonia to nitrite,

optionally, nitrifying microorganisms capable of converting nitrite to nitrate, and

facultative microorganisms capable of denitrifying nitrite and/or nitrate by oxidizing organic material and converting nitrite and/or nitrate to free nitrogen, and

allowing the nitrifying microorganisms capable of converting ammonia to nitrite, nitrifying microorganisms capable of converting nitrite to nitrate, if present, and facultative microorganisms, each having a different growth rate, to grow and become acclimated to the level of ammonia, and other contaminants if present, by feeding the wastewater to the activated sludge system and microorganisms population at a rate sufficiently high to a stimulate microbial cell division but at a rate insufficiently high that an inhibitory level of ammonia, and other contaminants if present, in the wastewater is not reached, thereby causing the nitrifying microorganisms capable of converting ammonia to nitrite, nitrifying microorganisms capable of converting ammonia to nitrite to nitrate, if present, and facultative microorganisms to grow relatively such that the microorganism population becomes acclimated to the wastewater contaminants and their levels in the wastewater.

4,537,683

TRIHALOMETHANE PRECURSOR REMOVAL USING ION EXCHANGE EMULSIONS

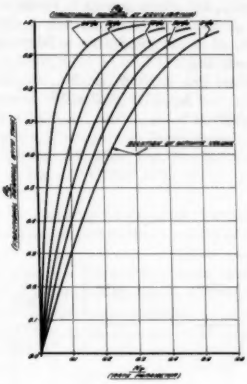
Eric G. Isacoff, Richboro, and James W. Neely, Dresher, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 482,684, Apr. 6, 1983, abandoned, which is a continuation-in-part of Ser. No. 344,584, Feb. 1, 1982, abandoned. This application Nov. 18, 1983, Ser. No. 553,225

Int. Cl.³ C02F *1/42*

U.S. Cl. 210—667 **15 Claims**

1. A process for removing trihalomethane precursors from water containing said precursors which comprises treating the water, at a rate of from about 1 to about 25 milligrams of resin per liter of water, with a fine-particle-size anion exchange resin having an equilibrium parameter of $K_e=6\times10^5$ cm³/g or greater, a kinetic parameter of $K_k=6$ sec^{-1} or greater, and a



combined value of $K_e/10^5+K_k$ of about 13 to about 22, and subsequently removing the resin from the water.

4,537,684

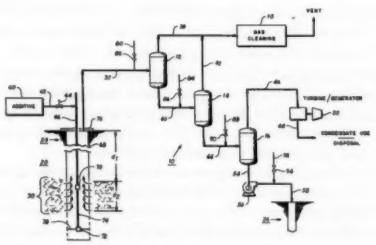
CONTROL OF METAL-CONTAINING SCALE DEPOSITION FROM HIGH TEMPERATURE BRINE

Darrell L. Gallup, Ontario, and John W. Jost, Santa Ana, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Dec. 29, 1983, Ser. No. 566,484

Int. Cl.³ C02F *5/08*

U.S. Cl. 210—696 **21 Claims**

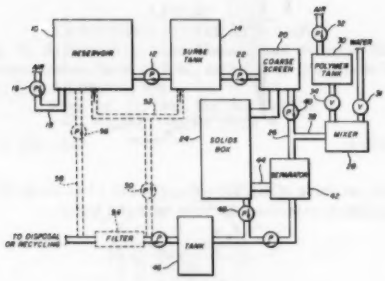


16. A method for inhibiting the precipitation of iron silicate scales from a hot, pressurized stream of geothermal brine containing dissolved iron and silicon components and further containing trivalent iron or manganese cations, said method comprising (A) adding to the brine stream before pressure reduction (1) an amount of a water-soluble acid sufficient to lower the pH of the stream by between about 0.1 and 0.5 pH unit to form a pH modified stream, and (2) a greater than stoichiometric amount of a reducing agent compatible with the pH modified stream for reducing the trivalent cations of iron and manganese contained therein to divalent ions so as to decrease precipitation of iron silicate containing scales and to dissolve any previously formed iron silicate containing scales while inhibiting corrosion to liquid handling equipment that confines and contains the stream, and (B) subjecting said stream to sudden pressure reduction so that at least a portion of the stream flashes to produce steam.

4,537,685
METHOD FOR SEPARATING INTERMIXED SOLIDS AND LIQUIDS

Alvin B. Kennedy, III, Alvin; Joseph S. Fontaine, West Columbia; Alfred J. Kennard, Houston, and J. Bruce Morrison, Friendswood, all of Tex., assignors to Methods Engineering, Inc., Angleton, Tex.

Filed Feb. 1, 1983, Ser. No. 463,006
Int. Cl.[3] C02F 1/56
U.S. Cl. 210—709 3 Claims



1. A continuous method useful in the separation of intermixed solids and liquid phase components of wastes so as to facilitate the recycling or disposal thereof, comprising the steps of:

(a) pretesting a sample of the waste designated for treatment so as to determine the character of solid waste matter and content of suspended and/or settled waste solids,

(b) selecting a polyelectrolyte compound calculated to react most effectively with the tested waste, said polyelectrolyte compound being a high molecular weight polymer emulsion selected from the group consisting of cationic, and anionic and non-ionic polymers,

(c) calculating a dosage rate determined to overflocculate the waste matter and to achieve optimal efficiency from the polyelectrolyte-waste matter reaction so as to achieve solid waste particles which will freely dewater, which are larger than 20 mesh, and which exhibit an appropriate durability factor to allow separation of the solid waste particles from the liquid phase,

(d) air sparging the waste source to promote consistency and fluidity so as to minimize adjustment of the dosage rate of polyelectrolyte compounds to waste matter,

(e) continuously diluting the polyelectrolyte compound with water,

(f) introducing the diluted polyelectrolyte compound into the waste matter without mechanical agitation at a varying rate so as to achieve over-flocculation of the suspended and/or settled waste solids,

(g) separating the over-flocculated solid waste particles from the treated liquid waste with a vibratory shaker screen,

(h) recycling all of the treated liquid for further use as a pre-treatment for untreated waste thereby reducing the overall polyelectrolyte requirement for continued treatment, and elminating the need to remove the polyelectrolyte from the liquid.

4,537,686
CYANIDE REMOVAL FROM AQUEOUS STREAMS

Gyula J. Borbely, Copper Cliff; Eric A. Devuyst, Toronto; Victor A. Ettel, Mississauga; Marcel A. Mosoiu, Toronto, and Konstantin J. Schitka, Sudbury, all of Canada, assignors to INCO Limited, Toronto, Canada

Filed Mar. 8, 1984, Ser. No. 587,611
Int. Cl.[3] C02F 1/58
U.S. Cl. 210—713 21 Claims

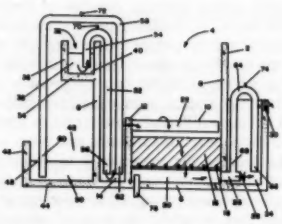
1. The method for treating aqueous effluent to reduce the total cyanide content of said aqueous effluent solution which comprises treating said effluent solution with an oxygen-containing gas and a reagent from the group consisting of sulfur dioxide, an alkali or alkaline earth metal sulfite or bisulfite, at a pH of about 5 to about 12 in the presence of a copper catalyst.

19. The method for treating effluent solution and tailings from gold mining operations, said operations involving the leaching of comminuted gold ore with aqueous cyanide and recovery of soluble gold from said aqueous cyanide solution comprising treating essentially gold-barren aqueous effluent and tailings to reduce the total cyanide content thereof with an oxygen-containing gas and a reagent from the group consisting of sulfur dioxide and an alkaline earth or alkali metal sulfite or bisulfite at a pH of about 5 to about 12 in the presence of a copper catalyst at ambient temperature for said effluent and tailings and discharging said effluent and tailings to a disposal site without interposing any gold recovery operation between said treatment and said disposal site.

4,537,687
OPEN GRAVITY BACKWASH FILTER AND METHOD

Louis H. Piper, Richmond, Va., assignor to Infilco Degremont Inc., Richmond, Va.

Filed Jun. 1, 1984, Ser. No. 616,171
Int. Cl.[3] B01D 23/24
U.S. Cl. 210—793 8 Claims



1. An open gravity backwash filter comprising:

an filter basin defined by a first floor and an enclosure wall that extends vertically upwardly from said floor,

a filter compartment located within said filter basin defined along one side by a first vertical partition of less height than said wall and on the remaining sides by at least some of said enclosure wall of said filter basin,

a gullet located within said filter basin juxtaposed to said filter compartment defined along one side by said vertical partition and on the remaining sides by at least some of said enclosure wall of said filter basin,

a filter bed of particulate material supported in said filter compartment above said first floor on a perforate horizontal web,

a drainage space between said first floor and said horizontal web,

distribution means into said filter compartment from said gullet to distribute liquid to said filter compartment from said gullet,

an effluent channel juxtaposed to said filter basin,

a conduit connecting said drainage space to said effluent channel for flow of liquid between them,

a weir in said effluent channel having a vertical height

greater than the height of said distribution means and less than the height of said enclosure wall,

an influent channel juxtaposed to said filter basin defined by a second floor and sidewalls,

a vertical transverse partition in said influent channel of less height than said sidewalls of said influent channel creating in said influent channel an inlet water seal chamber,

a waste channel juxtaposed to said filter basin defined by a third floor and sidewalls,

a vertical overflow baffle in said waste channel that creates in said waste channel an exit water seal chamber,

a first siphon that extends above the height of said enclosure wall of said filter basin, one end of said first siphon extending into said inlet water seal chamber and its other end extending into said gullet,

a second siphon that extends above the height of said enclosure wall of said filter basin, one end of said second siphon extending into said exit water seal chamber and its other end extending into said gullet,

a third siphon that extends above the height of said weir, one end of said third siphon extending into said effluent channel and its other end being connected for flow of liquid from it into said drainage space,

ports in each of said siphons at approximately the highest point of each siphon by which the siphons may be primed by application of vacuum to said ports or deactivated by opening of said ports.

8. In a method of removing suspended material from a aqueous suspension thereof by flowing in a filter mode said suspension from a gullet on to and through a filter bed of particulate material contained in a filter chamber to produce filtered effluent and in a backwash mode regeneration of said bed by backwashing said bed thereby producing waste effluent that is passed to a waste channel, the improvement which comprises:

flowing said filtered effluent in said filter mode into an effulent channel,

controlling the height of said filtered effluent in said effluent channel so that it is higher at the completion of said filter mode than the top of said filter bed,

providing aqueous suspension to be filtered via an influent channel at a level above the top of said filter bed,

siphoning during said filter mode aqueous suspension from said influent channel into said gullet,

siphoning during said backwash mode filtered effluent from said effluent channel into said filter chamber beneath said filter bed, and

siphoning during said backwash mode waste effluent from said gullet into said waste channel.

4,537,688

LOW AND HIGH TEMPERATURE DRILLING FLUIDS BASED ON SULFONATED TERPOLYMER IONOMERS

Dennis G. Peiffer, East Brunswick; Robert D. Lundberg, Bridgewater, both of N.J., and Kenneth W. Pober, Houston, Tex., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Nov. 2, 1983, Ser. No. 547,906
Int. Cl.[3] C09K *7/06*

U.S. Cl. 252—8.5 M **11 Claims**

1. An oil-based drilling mud which comprises:

(a) an hydrocarbon liquid substantially immiscible with water;

(b) about 1 to about 10 parts by weight of water per 100 parts by weight of the hydrocarbon liquid;

(c) about 20 to about 50 lb/bbl. of at least one emulsifier;

(d) weighting material necessary to achieve the desired density; and

(e) about 0.25 to about 6.0 lb/bbl. of a neutralized sulfonated thermoplastic terpolymer having an $\overline{Mn}$ as measured by GPC of about 5,000 to about 200,000, said neutralized sulfonated thermoplastic polymer having about 5 to about 100 meq. of sulfonate groups per 100 grams of the neutralized sulfonated thermoplastic terpolymer, wherein said sulfonated thermoplastic terpolymer is a terpolymer of t-butyl-styrene/sodium styrene sulfonate/styrene and is prepared by the free radical emulsion terpolymerization of said t-butyl styrene,styrene and sodium styrene sulfonate.

4,537,689

ORAL LUBRICANT FOR ATHLETIC MOUTH PROTECTOR

Robert M. Morrow; William A. Kuebker, both of San Antonio, and James W. McGinity, Austin, all of Tex., assignors to The Board of Regents, University of Texas System, Austin, Tex.

Filed Dec. 19, 1983, Ser. No. 563,239
Int. Cl.[3] C10M *5/00, 1/06*

U.S. Cl. 252—11 **14 Claims**

1. A method for reducing the discomfort associated with the wearing of mouth protectors during a period of physical activity comprising:

applying to a mouth protector a composition consisting essentially of a lubricating agent, a thickening agent, a pharmaceutically suitable sweetner, a pharmaceutically suitable flavoring agent, a preservative, and water; and

thereafter inserting said mouth protector into the oral cavity.

4,537,690

AQUEOUS METALWORKING COMPOSITION CONTAINING 2-HYDROXYETHYL-(3-CHLORO-2-HYDROXY-PROPYL)SULFIDE

Gary D. Macdonell; Merlin R. Lindstrom; Bernard A. Baldwin; Rector P. Louthan, and Alexander D. Schuettenberg, all of c/o Ste. 1107, 1825 K St. N.W., Washington, D.C. 20006, assignors to Phillips Petroleum Co., Bartlesville, Okla.

Filed Aug. 17, 1984, Ser. No. 641,652
Int. Cl.[3] C10M *3/24, 3/32*

U.S. Cl. 252—48.4 **8 Claims**

1. A metalworking composition comprising an extreme pressure effective amount of 2-hydroxyethyl-(3-chloro-2-hydroxypropyl)sulfide with an effective amount of (1) lubricity additive, (2) pH adjusting compound, (3) rust inhibitor and (4) biocide in an aqueous medium.

4,537,691

SILICONE-BASED WORKING FLUID COMPOSITION

Shigeru Mori, Gunma; Yoshiaki Kudo, Tokyo, and Satoshi Kuwata, Gunma, all of Japan, assignors to Shin-Etsu Chemical Co. Ltd., Tokyo, Japan

Filed Nov. 2, 1984, Ser. No. 667,535
Claims priority, application Japan, Nov. 14, 1983, 58-213474
Int. Cl.[3] C10M *3/46*

U.S. Cl. 252—49.6 **3 Claims**

1. A silicone-based working fluid composition which comprises:

(A) 100 parts by weight of a diorganopolysiloxane or a mixture of diorganopolysiloxanes each represented by the general formula

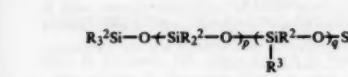
$$R^1—SiR^2_2-O)_mSiR^2_2-R^1,$$

in which each R^1 is trihydrocarbylsiloxy group or a hydroxy group independently from the other, R^2 is an alkyl group or a phenyl group and m is a positive integer in the range from 20 to 2000, the groups denoted by R^1 in the overall component (A) being a combination of trihydrocarbylsiloxy groups and hydroxy groups in such a molar proportion of the former to the latter in the range from 95/5 to 10/90, and

(B) from 0.01 to 5 parts by weight of an organopolysiloxane represented by the general formula

$$R^3—SiR^2_2-O)_nSiR^2-R^3$$

or



in which R^2 has the same meaning as defined above, R^3 is an imino-substituted phenoxy group selected from the class consisting of 4-anilinophenoxy group, 4-(4-anilino)anilinophenoxy group, 4-(α-naphthylamino)phenoxy group and 4-(β-naphthylamino)phenoxy group, n is a positive integer in the range from 1 to 50, q is a positive integer in the range from 1 to 10 and p is zero or a positive integer with the proviso that p+q is in the range from 1 to 48.

4,537,692

ETHERDIAMINE BORATES AND LUBRICANTS CONTAINING SAME

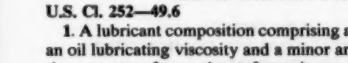
Andrew G. Horodysky, Cherry Hill, and Richard S. Herd, Woodbury, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 535,133, Sep. 23, 1983,. This application Aug. 31, 1984, Ser. No. 646,199

Int. Cl.³ C10M *1/54, 1/10*

U.S. Cl. 252—49.6 **15 Claims**

1. A lubricant composition comprising a major proportion of an oil lubricating viscosity and a minor antioxidant or antifriction amount of a product of reaction made by reacting a N-hydroxcarbyloxyhydrocarbyleneamine of the formula



wherein R is a hydrocarbyl group containing 6 to 30 carbon atoms, R^1 and R^2 are hydrocarbylene groups containing 2 to 3 carbon atoms and R^3 is hydrogen or a C_1 to C_5 hydrocarbyl group with a boron compound.

4,537,693

LUBRICATING OIL COMPOSITIONS CONTAINING METHYLOL POLYETHER AMINO ETHANES

Curtis B. Campbell, Rodeo, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed May 31, 1983, Ser. No. 499,132

Int. Cl.³ C20M *1/32*

U.S. Cl. 252—51.5 R **8 Claims**

1. A lubricating oil composition comprising a major portion of oil of lubricating viscosity, and an amount sufficient to provide dispersancy of a hydrocarbyl methylol polyoxyalkylene amino ethane of molecular weight from about 300 to about 2500; wherein said hydrocarbyl group contains from 5 to about 30 carbon atoms, said polyoxyalkylene moiety comprises 1 to 30 oxyalkylene units selected from oxyalkylene units having from 2 to 4 carbon atoms, said ethane moiety is a two carbon chain, or a two carbon chain substituted with one or two lower alkyl units of up to 5 carbon atoms each with the proviso that the alkyl units contain a different number of carbon atoms as those extending from the oxyalkylene units of the polyoxyalkylene moiety and said amino moiety is a polyamine which comprises from 2 to about 12 amine nitrogen atoms and from about 2 to 40 carbon atoms.

4,537,694

DIAMINE CARBOXYLATES AND LUBRICANT COMPOSITIONS CONTAINING SAME

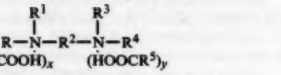
Andrew G. Horodysky, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 23, 1983, Ser. No. 535,140

Int. Cl.³ C10M *1/32*

U.S. Cl. 252—51.5 A **25 Claims**

1. A compound of the formula



wherein R, R^1, R^3 and R^4 with the N groups making up a diamino group are hydrogen or a C_6 to C_{20} hydrocarbyl group, at least one of R and R^1 being a hydrocarbyl group, R^2 is a C_2 to C_4 hydrocarbylene group, R^5 is a component of at least one acid group and is a C_6 to C_{20} hydrocarbyl group, x is 0 or 1 and y is 0 to 1, at least one of x and y being 1.

4,537,695

THERMAL ENERGY STORAGE COMPOSITIONS

Malcolm Hawe, 3 Broombank, Birkby, Huddersfield, West Yorkshire; David Marshall, 25 Park Dr., North Mirfield, West Yorkshire, and John R. Walker, 1 Salisbury Pl., Hipperholme, Halifax, West Yorkshire, all of England

Division of Ser. No. 465,379, Feb. 10, 1983, Pat. No. 4,470,917. This application Jun. 18, 1984, Ser. No. 621,774

Claims priority, application United Kingdom, Feb. 23, 1982, 8205280; Feb. 23, 1982, 8205281; Feb. 23, 1982, 8205282

Int. Cl.³ C09K *3/18*

U.S. Cl. 252—70 **10 Claims**

1. A thermal energy storage composition comprising a thermal energy storage hydrate material that includes polyvalent metal ions and that is held in a thermally conducting matrix of cationic polymeric material that is water absorbent.

4,537,696

HYDRAULIC FLUIDS BASED ON TWO CENTISTOKE SYNTHETIC HYDROCARBONS

Bruce J. Beimesch, Crescent Springs, Ky., assignor to National Distillers and Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 419,894, Sep. 20, 1982, abandoned. This application Sep. 30, 1982, Ser. No. 537,772

Int. Cl.³ C10M *3/12;* **C07C** *2/74*

U.S. Cl. 252—75 **5 Claims**

1. A hydraulic fluid characterized by having a minimum viscosity of 5.5 centistokes at 210 °F., a maximum viscosity of 1400 centistokes at −40° F. and viscosity index of 230 or above and comprised of:

(a) 70 to 87 percent by weight of a synthetic hydrocarbon having a 210° F. viscosity of 1.6 to 2.2 centistokes and obtained from the oligomerization of 1-decene or an alpha-olefin mixture containing a major proportion of 1-decene;

(b) 12 to 20 percent by weight of a polymethacrylate viscosity index improver wherein the polymer has a weight average molecular weight of 20,000 to 70,000; and

(c) 0.25 to 3.0 percent by weight of a zinc-based universal/-multifunctional additive package which contains 3–8 percent zinc, 2.5–6 percent phosphorous and 5–14 percent sulphur.

4,537,697

METHOD OF ENHANCING SOLUBILITY OF HALOGENATED HYDANTOINS

Theodore A. Girard, Williamsport, Pa., assignor to Glyco, Inc., Norwalk, Conn.

Filed Dec. 16, 1983, Ser. No. 562,088

Int. Cl.³ C11D *7/54, 17/00*

U.S. Cl. 252—90 **23 Claims**

17. A method of increasing the rate of solubility of a halogenated hydantoin in an aqueous solution, which comprises adding to said solution a halogenated hydantoin and a solubility agent selected from the group consisting of magnesium oxide, barium hydroxide, and mixtures thereof, in an amount sufficient to increase the rate of solubility of the halogenated hydantoin in the aqueous solution.

4,537,698

LIQUID CRYSTALLINE PIPERIDINE DERIVATIVES

Wolfgang Sucrow; Wolfgang Schatull, both of Paderborn, and Peter Fuss, Mühltal-Traisa, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

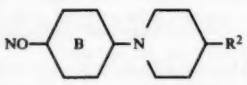
Filed May 31, 1983, Ser. No. 499,685

Claims priority, application Fed. Rep. of Germany, May 28, 1982, 3220155

Int. Cl.[3] C09K *3/34;* G02F *1/13;* C07D *211/08, 211/62, 211/38, 211/20, 211/14*

U.S. Cl. 252—299.61 10 Claims

1. A liquid crystalline dielectric material useful in electro-optical display elements and comprising at least two liquid crystalline components, wherein at least one component is a piperidine derivative of the formula



wherein

R^2 is alkyl or alkoxy each of 1 to 10 carbon atoms, F, CL or Br or an acid addition salt thereof.

4,537,699

PROCESS FOR IMPROVING THE RHEOLOGICAL PROPERTIES OF A SUSPENSION OF PRECIPITATED SILICA

Jean-Noel Jas, Fontaine-sur-Saone, France, assignor to Rhone-Poulenc Specialites Chimiques "Les Miroirs", France

Filed Nov. 23, 1983, Ser. No. 554,640

Claims priority, application France, Nov. 24, 1982, 82 19646

Int. Cl.[3] B01J *13/00;* C01B *33/14, 33/18, 33/141*

U.S. Cl. 252—313.2 38 Claims

1. A process for making a sprayable suspension of precipitated silica comprising the steps of:

a. providing an aqueous suspension of precipitated silica having a solids content of at least about 15% by weight; and

b. adding to the aqueous suspension an aluminum compound to produce a sprayable suspension having a pH value greater than 3.5.

4,537,700

ORGANIC GELS

Robert J. Purinton, Jr., Tulsa County, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 338,928, Jan. 12, 1982, Pat. No. 4,473,408.

This application Mar. 26, 1984, Ser. No. 593,074

Int. Cl.[3] B01J *13/00;* B08B *9/04*

U.S. Cl. 252—315.1 12 Claims

1. An organic gel comprising: (a) a nonpolar, liquid, organic solvent, and (b) a gelling amount of a gelling agent mixture of (1) a phosphate ester component which is composed predominantly of an ethyl oleyl phosphate and (2) an alkali metal aluminate.

4,537,701

DEMULSIFIERS FOR BREAKING CRUDE-OIL EMULSIONS AND THEIR USE

Knut Oppenlaender; Rolf Fikentscher; Egon Buettner; Wilhelmus Slotman; Erich Schwartz, all of Ludwigshafen, and Rudolf Mohr, Lampertheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 899,331, Apr. 24, 1978, abandoned.

This application Dec. 11, 1981, Ser. No. 330,027

Claims priority, application Fed. Rep. of Germany, May 4, 1977, 2719978

Int. Cl.[3] B01D *17/04;* C09K *3/00*

U.S. Cl. 252—344 8 Claims

1. A petroleum demulsifier which contains, as the active ingredients:

(A) from 25 to 75 percent by weight, based on the total active ingredients, of an oxyethylation product or a mixed oxyethylation-oxypropylation product of an isoalkylphenol-formaldehyde resin which contains per molecule from 3 to 30 benzene nuclei each carrying an oxyalkylate group comprising from 4 to 50 alkylene oxide units and, in the p-position to the oxyalkylate group, an isoalkyl radical of 8 to 12 carbon atoms, and

(B) from 75 to 25 percent by weight, based on the total active ingredients, of one or more polyalkylenepolyamines having at least 50 and up to 3,000 recurring ethylene imine or propylene imine units per molecule and in which each nitrogen is completely oxyalkylated with from 10 to 200 alkylene oxide units.

5. A process for breaking crude oil emulsions, in which from 1 to 1,000 ppm, based on the weight of the emulsion to be broken, of a petroleum demulsifier is added to the emulsions, at from 20° to 80° C., which demulsifier contains, as the active ingredients,

(A) from 25 to 75 percent by weight, based on the total active ingredients, of an oxyethylation product or a mixed oxyethylation-oxypropylation product of an isoalkylphenol-formaldehyde resin which contains per molecule from 3 to 30 benzene nuclei each carrying an oxyalkylate group comprising from 4 to 50 alkylene oxide units and, in the p-position to the oxyalkylate group, an isoalkyl radical of 8 to 12 carbon atoms, and

(B) from 75 to 25 percent by weight, based on the total active ingredients, of one or more polyalkylenepolyamines having at least 50 and up to 3,000 recurring ethylene imine or propylene imine units per molecule and in which each nitrogen is completely oxyalkylated with from 10 to 200 alkylene oxide units.

4,537,702

PERFUME AND FLAVORING COMPOSITIONS, PERFUMED ARTICLES AND MATERIALS, AND FLAVORED FOOD PRODUCTS CONTAINING AN OXASPIRODECADIENE DERIVATIVE AS THE ESSENTIAL COMPOUND, AS WELL AS THE OXASPIRO[4.5]DECADIENE DERIVATIVE PER SE

Antonius J. A. van der Weerdt, Huizen, and Harrie Renes, Blaricum, both of Netherlands, assignors to Naarden International N.V., Naarden-Bussum, Netherlands

Filed May 10, 1983, Ser. No. 493,412

Claims priority, application Netherlands, May 13, 1982, 8201991

Int. Cl.[3] A61K *7/46;* C07D *307/94*

U.S. Cl. 252—522 R 4 Claims

1. Perfume and flavoring compositions, perfumed articles and materials, and flavoured food products containing an oxa-spirodecadiene derivative as the basic compound, characterized by a content of 10-isopropyl-2,7-dimethyl-1-oxaspiro[4.5]deca-3,6-diene as the oxa-spirodecadiene derivative.

4. 10-Isopropyl-2,7-dimethyl-1-oxaspiro[4.5]deca-3,6-diene.

4,537,703
BOROSILICATE GLASS COMPOSITIONS

Jacob Hormadaly, Wilmington, Del., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed Dec. 19, 1983, Ser. No. 562,966
Int. Cl.[3] C03C *3/08, 3/10;* H01B *1/06*
U.S. Cl. 252—518 5 Claims

1. A glass which is suitable for use as a binder in high end resistors, which is substantially free of Bi, Cd and Pb and on a molar basis consists essentially of:

A. 50–85% of glass forming materials consisting of 25–50% B_2O_3, 15–40% SiO_2, and 0.1–5% SnO_2, and

B. 50–15% of glass modifying materials consisting of 10–30% BaO, 0–12% MgO and 1–10% NiO, providing that

(1) the mole ratio $B_2O_3/SiO_2 \geqq 0.8$; and

(2) $\Sigma(B_2O_3+SiO_2) \geqq 50$.

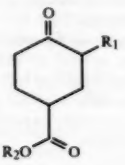
4. A printable thick film resistor composition comprising a dispersion in organic medium of an admixture of finely divided particles of (a) 95–55% wt. tin oxide pyrochlore-based material and (b) 5–45% wt. of the glass of claim 1 or the composition of claim 3.

4,537,704
ALKYL SUBSTITUTED AND UNSUBSTITUTED PARA-CARBOALKOXY CYCLOHEXANONES AND ORGANOLEPTIC USES THEREOF

Mark A. Sprecker, Sea Bright; Wilhelmus J. Wiegers, Red Bank; Robert P. Belko, Woodbridge, and Richard M. Boden, Ocean, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Dec. 21, 1983, Ser. No. 563,801
Int. Cl.[3] C11B *9/00*
U.S. Cl. 252—522 R 5 Claims

1. A process for augmenting or enhancing the aroma of a consumable material selected from the group consisting of perfume compositions, colognes and perfumed articles comprising the step of adding to said consumable material an aroma augmenting or enhancing quantity of at least one compound defined according to the structure:



wherein R_1 represents C_5 or C_6 alkyl and R_2 represents methyl or ethyl.

4,537,705
AQUEOUS ALKALINE POLYAMINE PAINT STRIPPING COMPOSITIONS

Dennis F. Mahoney, Hastings, and William V. Block, Apple Valley, both of Minn., assignors to Economics Laboratory, Inc., St. Paul, Minn.

Filed Apr. 25, 1984, Ser. No. 603,679
Int. Cl.[3] C11D *7/14, 7/52*
U.S. Cl. 252—529 34 Claims

1. An alkaline paint remover composition having reduced toxicity and improved heat stability which comprises:

an aqueous solution comprising about 2–40% of an alkali metal hydroxide and about 0.2–10% of a polyalkylene polyamine of the formula:

$$(R_1)(R_2)NXN(R_1)(R_2)$$

wherein R_1 and R_2 are selected from the group consisting of hydrogen, (lower)alkyl and $[CH_2CH(Y)O]_mH$, wherein Y is hydrogen or (lower)alkyl and m is about 1–4; and X is polyoxy(lower)alkylene.

4,537,706
LIQUID DETERGENTS CONTAINING BORIC ACID TO STABILIZE ENZYMES

Roland G. Severson, Jr., Mason, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed May 14, 1984, Ser. No. 609,944
Int. Cl.[3] C11D *1/14, 7/42*
U.S. Cl. 252—545 13 Claims

1. A heavy-duty liquid detergent composition comprising, by weight:

(a) from about 10% to about 50% of an anionic synthetic surfactant;

(b) from about 3% to about 30% of a C_{10}–C_{22} fatty acid;

(c) from about 2% to about 15% of a water-soluble detergency builder;

(d) from about 0.01% to about 5% of a proteolytic or amylolytic enzyme;

(e) from about 0.25% to about 10% of boric acid or a boron compound capable of forming boric acid in the composition;

(f) from about 1 to about 30 millimoles of calcium ion per liter of composition; and

(g) from about 20% to about 80% of water.

4,537,707
LIQUID DETERGENTS CONTAINING BORIC ACID AND FORMATE TO STABILIZE ENZYMES

Roland G. Severson, Jr., Mason, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed May 14, 1984, Ser. No. 609,945
Int. Cl.[3] C11D *1/14, 7/42*
U.S. Cl. 252—545 14 Claims

1. A heavy-duty liquid detergent composition comprising, by weight:

(a) from about 10% to about 50% of an anionic synthetic surfactant;

(b) from about 3% to about 30% of a C_{10}–C_{22} fatty acid;

(c) from about 2% to about 15% of a water-soluble detergency builder;

(d) from about 0.01% to about 5% of a proteolytic enzyme;

(e) from about 0.25% to about 10% of boric acid or a boron compound capable of forming boric acid in the composition;

(f) from about 0.05% to about 5% of a water-soluble formate;

(g) from about 1 to about 30 millimoles of calcium ion per liter of composition; and

(h) from about 20% to about 80% of water.

4,537,708
HOMOGENEOUS LAUNDRY DETERGENT SLURRIES CONTAINING NONIONIC SURFACE-ACTIVE AGENTS

Gale D. Downey, Pennington, N.J., and Charles E. Jones, Yardley, Pa., assignors to FMC Corporation, Philadelphia, Pa.

Filed Aug. 30, 1983, Ser. No. 527,895
Int. Cl.[3] C11D *1/83, 3/065, 11/00, 3/04*
U.S. Cl. 252—554 17 Claims

1. A stable, homogeneous aqueous detergent slurry consisting essentially of:

a. a sodium polyphosphate in amounts of from about 14 weight percent to about 30 weight percent,

b. an alkali metal salt or alkali metal hydroxide in amounts of from about 1 weight percent to about 5 weight percent,

c. a soluble, anionic surface-active agent selected from the group consisting of alkyl-, alkylaryl-, alkene-sulfate salts and alkyl-, alkylaryl-, and alkene-sulfonate salts,

d. a soluble, nonionic surface-active agent which is an alcohol alkoxylate having a hydrophilic-lipophilic balance (HLB value) of from about 4 to about 9,

e. said sodium polyphosphate being present in part as insoluble particles having an average diameter of about 1 to 10 microns,

f. said anionic and nonionic surface-active agents being present in a weight ratio of about 6.7:1 to about 1.35:1, and

g. the total amount of said surface-active agents in said detergent slurry being from about 13 weight percent to about 20 weight percent.

4,537,709

LIQUID DETERGENT COMPOSITION COMPRISING SELECTED ALKYLBENZENE SULPHONATES AND ALKYL ETHER SULPHATES

David J. Edge, Chester; Appaya R. Naik, Merseyside, and Melvin Scott, Cheshire, all of England, assignors to Lever Brothers Company, New York, N.Y.

Filed Nov. 14, 1983, Ser. No. 551,456

Claims priority, application United Kingdom, Nov. 16, 1982, 8232644

Int. Cl.³ C11D *1/12, 1/29, 1/37, 3/065*

U.S. Cl. 252—558 **14 Claims**

1. A foaming liquid detergent composition in the form of a stable aqueous solution containing from 2 to 60% by weight of an active detergent mixture comprising

(a) a linear C_{10}–C_{13}alkylbenzene sulphonate substantially free of material of other alkyl chain length and having a C_{13} content not exceeding 15% by weight if its 2-phenyl isomer content is 30% by weight or more, or not exceeding 30% by weight if its 2-phenyl isomer content is less than 30% by weight, and

(b) a C_{10}–C_{18} primary alkyl ether sulphate containing 20% by weight or less of C_{14} and above chain length material and having an average degree of ethoxylation of from 1 to 12,

the weight ratio of (a) to (b) being within the range of from 8:1 to 0.5:1, and the composition being substantially free from alkylbenzene sulphonates and alkyl ether sulphates other than those defined under (a) and (b) above.

4,537,710

METHOD OF STORING RADIOACTIVE WASTES USING MODIFIED TOBERMORITE

Sridhar Komarneni, and Della M. Roy, both of State College, Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 31, 1983, Ser. No. 547,266

Int. Cl.³ G21F *9/16*

U.S. Cl. 252—628 **5 Claims**

1. A method of fixing metal ions contained in liquid low and intermediate level nuclear wastes for long-term storage comprising:

contacting the liquid waste with an ion-exchange material which is a modified tobermorite containing aluminum isomorphously substituted for silicon and containing per 100 grams, about 1 to 200 milliequivalents of an alkali metal selected from the group consisting of sodium, potassium and mixtures thereof, whereby the metal ions in the liquid waste are taken up by the ion-exchange material;

separating the ion-exchange material from the liquid;

mixing the ion-exchange material containing the ions with portland cement to form a mixture containing up to about 40 weight percent ion-exchange material; and

solidifying the mixture, thereby fixing the ions for long-term storage.

4,537,711

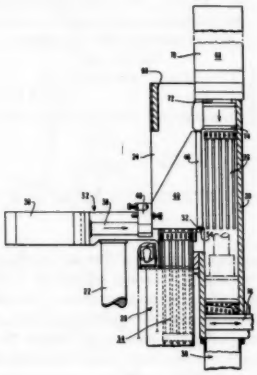
FUEL ASSEMBLY SKELETON COMPACTION

John J. Wilhelm, New Kensington; Anoop Kapoor, Monroeville; Richard M. Kobuck, Delmont; Ronald F. Antol, North Huntingdon, and George W. Norris, Wilkins Township, Allegheny County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 5, 1983, Ser. No. 455,684

Int. Cl.³ G21F *9/22, 9/34;* **B30B** *15/06*

U.S. Cl. 252—633 **7 Claims**



1. Apparatus for compacting an irradiated nuclear fuel assembly skeleton while said skeleton remains submerged in a water coolant comprising:

a vertically disposed compaction housing mounted on a plurality of vertical supports and defining therein a shear chamber and a compaction chamber;

a first cylinder horizontally disposed relative to said compaction housing;

a first piston connected to said first cylinder,

a vertically disposed first side plate slidably connected to said compaction housing;

a vertically disposed second side plate slidably connected to said compaction housing;

a front plate attached to said first and second side plates;

a blade mounted on the bottom and leading edge of said front plate;

a shear mounted in said shear chamber and in alignment with said blade for shearing said skeleton when said skeleton is forced between said front plate and said shear;

a mounting mechanism attached at one end to said first and second side plates and at the other end to said first piston and capable of sliding horizontally into and out of said shear chamber for causing said front plate and said shear to contact said skeleton thereby shearing said skeleton into a plurality of pieces and thereby moving said pieces into said compaction chamber;

a feed chamber vertically disposed and attached to said compaction housing near said shear chamber for introducing said skeleton into said shear chamber;

an elevator mechanism disposed in said feed chamber for selectively moving said skeleton in said feed chamber and into said shear chamber;

a compaction device mounted on said compaction housing near said compaction chamber for compacting said pieces of said skeleton that are introduced into said compaction chamber by said front plate; and

a canister vertically disposed under said compaction device for receiving the compacted pieces of said skeleton.

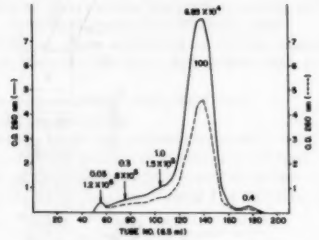
4,537,712
NON-SPECIFIC SUPPRESSIVE FACTORS AND PROCESS

Se-Kyung Oh, Brookline, Mass., assignor to Trustees of Boston University, Boston, Mass.

Continuation of Ser. No. 325,710, Nov. 30, 1981, abandoned. This application Sep. 19, 1983, Ser. No. 533,065

Int. Cl.[3] **C07G** *7/00*

U.S. Cl. 260—112 R **1 Claim**



1. The process of obtaining a pure composition derived from human ascites fluid of a cancer patient or Cohn fraction IV having non-specific immunosuppressive factor activity and free of carbohydrate moities consisting of reduced immunosuppressive factor having a molecular weight of about 25,000, which composition is free from the components of immunosuppressive factor which degrade the immunosuppressive factor, said composition being reactive with anti-human thymocyte serum or anti-normal human, being non reactive with monoclonal antibodies to non-polymorphic HLA antigen or HLA-DR antigen, being cross-reacted with monoclonal antibody directed against sheep erythrocyte receptors on human peripheral T-cells, being absorptive with sheep erythrocyte and uniformly suppresses the PHA responsive donor lymphocytes regardless of HLA or HLA-DR and having an isoelectric point below about 4.0 which comprises forming a delipidated aqueous animal fluid containing immunosuppressive factor, precipitating the immunosuppressive factor by salt fractionation, passing said delipidated fluid through a gel filtration column resin to form a component rich in said immunosuppressive factor and substantially free of components of said ascites fluid that degrade said immunosuppressive factor, eluting said column with an aqueous salt solution to recover said component rich in immunosuppressive factor and contacting said component with anti-human IgG (Fc specific), recovering said pure composition and dissociating and separating said pure composition by column chromatography to obtain an active immunosuppressive factor having a molecule weight of about 25,000.

4,537,713
PROCESS FOR THE REDUCTION OF REDUCIBLE GROUPS AND ITS USE

Heiner Eckert, Lerchenauerstrasse 9, 8000 München 40, Fed. Rep. of Germany

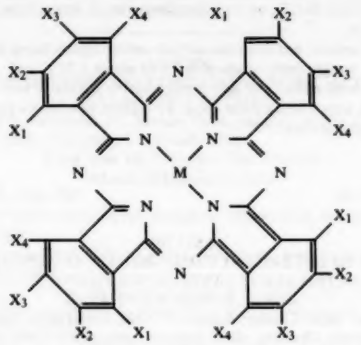
Filed May 19, 1982, Ser. No. 379,789

Claims priority, application Fed. Rep. of Germany, May 29, 1981, 3121478

Int. Cl.[3] **C07C** *103/52, 101/00, 69/76, 63/04, 101/04;* **C11C** *3/12;* **C07D** *265/30, 215/04*

U.S. Cl. 260—112.5 R **25 Claims**

1. Process for the reduction of reducible groups characterized in that an effective amount of a platinum-metal-phthalocyanine of the following formula is used as the catalyst:



where M is a metal of the platinum metal series, X^{1-4} is halogen, cyano or optionally other substituents with —I— effect, alkyl or aryl, while X^{2-3} can also be components of an annellated ring system or poly-Pc-structure, and X^{1-4} can independently substitute one or more of the benzoid rings, for a selective reduction at a temperature of 0° C. to 200° C. with an effective amount of hydrogen on [MPc], with M having a formal charge $z \geq 2$ to reduce the functional groups C=C, C=N, aromatic NO_2, aromatic CH=O, benzyl esters and aromatic halogen compounds, the latter being only reduced in a basic medium.

4,537,714
PROCESS FOR THE PREPARATION OF LOWER ALKYL ESTERS OF N-L-α-ASPARTYL-L-PHENYLALANINE AND OF NEW INTERMEDIATES FOR THEIR PREPARATION

Hans-Rudolf Müller, Schaffhausen, and Heinrich Bollinger, Beringen, both of Switzerland, assignors to Eprova Ag Forschungsinstitut, Schaffhausen, Switzerland

Filed Jul. 7, 1983, Ser. No. 511,672

Claims priority, application Switzerland, Jul. 20, 1982, 4433/82; Jan. 20, 1983, 4433/82

Int. Cl.[3] **C07C** *103/52*

U.S. Cl. 260—112.5 R **13 Claims**

1. A process for the selective preparation of N-L-α-aspartyl-L-phenylalanine-1-lower alkyl ester which comprises:

A. reacting an L-aspartic acid 4-arylmethyl ester with a

(i) 1,3-diketone; or

(ii) acylacetic ester;

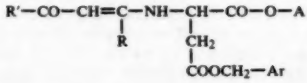
in the presence of a base to form the salt of

(i') L-N-(1-alkyl-2-acyl-vinyl)-aspartic acid 4-arylmethyl ester; or

(ii') L-N-(1-alkyl-2-alkoxycarbonyl-vinyl)-aspartic acid 4-arylmethyl ester,

and then either:

(1) reacting salt (i') or (ii') with an organic or inorganic acid halide having the formula X-A, wherein X represents a halogen and A has the meaning indicated hereinafter, or with an acid anhydride to form



I

wherein

R represents an alkyl radical with 1 to 6 carbon atoms;

R′ represents an alkyl or alkoxy radical with 1 to 6 carbon atoms;

Ar represents the phenyl, nitrophenyl, halogenphenyl or alkylphenyl radical; and

A represents an acyl with 2 to 12 carbon atoms, alkoxycarbonyl with 2 to 12 carbon atoms, or a phosphoric acid, phosphorous acid, sulfuric acid, sulfurous acid or sulfonic acid radical;

and reacting ester (I) with an L-phenylalanine lower alkyl ester;

(2) reacting a salt of (i') or (ii') with a phosphorazo-L-phenyl lower alkyl ester; to form

(i'') N-L-α-N'-(1-alkyl-2-acyl-vinyl)-aspartyl-L-phenylalanine-1-lower alkyl-4-arylmethyl ester; or

(ii'') N-L-α-N'-(1-alkyl-2-alkoxycarbonyl)-aspartyl-L-phenylalanine-1-lower alkyl-4-arylmethyl ester;

B. reacting (i'') or (ii'') with a strong acid to split off the respective N-(1-alkyl-2-acyl-vinyl) or N-(1-alkyl-2-alkoxycarbonyl-vinyl) protective group and produce:

(iii) N-L-α-aspartyl-L-phenylalanine-1-lower alkyl-4-(arylmethyl)ester; and

C. subjecting ester (iii) to catalytic hydrogenation to selectively split off the 4-(arylmethyl)-ester group and leave the N-L-α-aspartyl-L-phenylalanine-1-lower alkyl ester product.

4,537,715
GLYCOPEPTIDE ANTIBIOTIC CUC/CSV AND PROCESS FOR ITS PRODUCTION

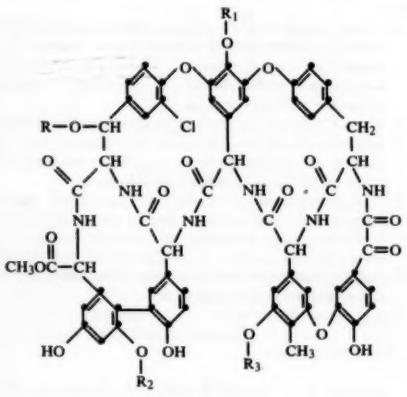
LaVerne D. Boeck; Gladys M. Clem, both of Indianapolis; Charles L. Hershberger, New Palestine; Marie T. Anderson, and Karl H. Michel, both of Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Oct. 21, 1983, Ser. No. 544,338

Int. Cl.[3] **C07C** *103/52;* **C12P** *21/04;* **A23K** *1/22*

U.S. Cl. 260—112.5 R **4 Claims**

1. Antibiotic CUC/CSV which has the formula:



wherein

R is L-ristosaminyl;

R_1 is the disaccharide mannosyl-glucosyl; and

R_2 and R_3 are mannosyl; and its salts.

4,537,716
DES-SERINE[2] OR DES-GLYCINE[2]-LEUCINE[22] CALCITONIN

Ronald C. Orlowski, Frankfort, and Jay K. Seyler, Bourbonnis, both of Ill., assignors to Armour Pharmaceutical Co., Tarrytown, N.Y.

Filed Dec. 5, 1983, Ser. No. 557,778

Int. Cl.[3] **C07C** *103/52*

U.S. Cl. 260—112.5 T **3 Claims**

1. Des-X^2-Leu^{22}-Calcitonin wherein X is serine or glycine, said calcitonin being a salmon, eel or human calcitonin deletion analog.

4,537,717
DERIVATIVES OF A-21978C CYCLIC PEPTIDES

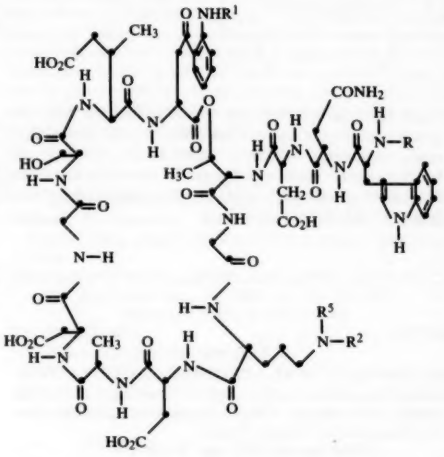
Bernard J. Abbott, Greenwood; Manuel Debono, Indianapolis, and David S. Fukuda, Brownsburg, all of Ind., assignors to Eli Lilly and Company, Ind.

Continuation of Ser. No. 573,901, Jan. 26, 1984, abandoned, which is a continuation of Ser. No. 493,447, May 11, 1983, abandoned, which is a continuation-in-part of Ser. No. 382,012, May 21, 1982, abandoned. This application Sep. 21, 1984, Ser. No. 652,695

Int. Cl.[3] **C07C** *103/52*

U.S. Cl. 260—112.5 R **30 Claims**

1. An A-21978C cyclic peptide derivative of the formula:



1

in which R, R^1 and R^2 are, independently, hydrogen, C_4–C_{14}-alkyl, optionally substituted C_2–C_{19}-alkanoyl, C_5–C_{19}-alkenoyl or an amino-protecting group; R^3, R^4 and R^5 are hydrogen or (i) R^3 and R^1 nd/or (ii) R^4 and R and/or (iii) R^5 and R^2, taken together, may represent a C_4–C_{14} alkylidene group; provided that (1) at least one of R, R^1 or R^2 must be other than hydrogen or an amino-protecting group, (2) at least one of R^1 or R^2 must be hydrogen or an amino-protecting group, (3) the R, R^1 and R^2 groups must together contain at least four carbon atoms, and (4) when R^1 and R^2 are both selected from hydrogen or an amino-protecting group, R cannot be 8-methyldecanoyl, 10-methyldodecanoyl, 10-methylundecanoyl, the mixes C_{10}-alkanoyl group of A-21978C_0 or the specific C_{12}-alkanoyl groups of A-21978C factors C_4 and C_5; and the salts thereof.

4,537,718
IMPERMEANT SPECTROSCOPIC PROBES

David Schachter, Bronx, N.Y.; Richard E. Abbott, Englewood, N.J., and Uri Cogan, Haifa, Israel, assignors to Columbia University in the City of New York, New York, N.Y.

Filed Oct. 26, 1982, Ser. No. 436,799

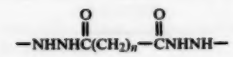
Int. Cl.[3] **C07C** *103/52;* **G01N** *21/84*

U.S. Cl. 260—112.5 R **6 Claims**

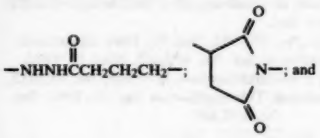
1. An impermeant spectroscopic probe, comprising:

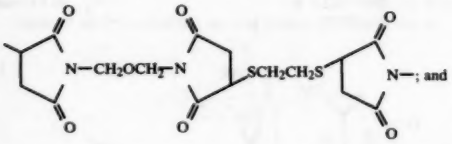
glutathione joined by a linkage group to a spectroscopic reporter group, wherein

(1) said linkage group is selected from the group consisting of



wherein n is 2, 4, 6, 8 or 10;





(2) said spectroscopic reporter group is selected from the group consisting of pyrenes, nitrobenz-oxa-diazoles, anthracenes, coumarins, acridines, anthranilates, bimanes, stilbenes, parinaric acids, and N-oxyl-4,4-dimethyloxayolidine derivatives of ketostearic acids or 2,2,5,5-tetramethyl-3-pyrrolin-1-oxyl-3-carboxylic acid.

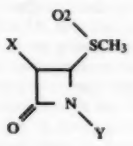
4,537,719

4-METHYLSULFONYL-AZETIDINONE DERIVATIVES

Toshihisa Kato; Hisao Iwagami, both of Kawasaki, and Naohiko Yasuda, Yokosuka, all of Japan, assignors to Ajinomoto Company Incorporated, Tokyo, Japan

Filed Sep. 30, 1982, Ser. No. 431,557
Claims priority, application Japan, Oct. 1, 1981, 56-156635
Int. Cl.³ C07D *205/08, 403/12;* **A61K** *31/495, 31/395*
U.S. Cl. 260—239 A **6 Claims**

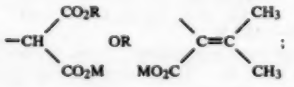
1. Azetidinone derivatives represented by the formula:



wherein

X is hydrogen, halogen, amino, methylamino, ethylamino, benzylamino, dimethylamino or acylamino selected from the group consisting of acetamide, arylacetamide, 2-amino-2-arylacetamide, 2-acylamino-2-arylacetamide, or D(−)1-α-(4-ethyl-2,3-dioxo-1-piperazinecarboxamide)-α-(4-hydroxyphenyl)acetamide); and

Y is



wherein R is lower alkyl, benzyl, or 2,2,2-trichloroethyl, and M is hydrogen or alkali metal.

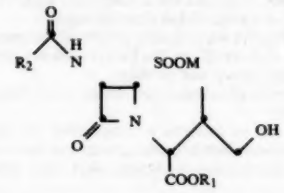
4,537,720

N-SUBSTITUTED-2-(R)-(SULFINIC ACID)-3-(S)-(ACYLAMINO)-4-OXO-AZETIDINES AND PROCESS

David A. Hall, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 442,075, Nov. 16, 1982, Pat. No. 4,436,596.
This application Dec. 12, 1983, Ser. No. 560,283
Int. Cl.³ C07D *205/08, 403/12, 405/12, 409/12*
U.S. Cl. 260—239 A **33 Claims**

1. A compound of the formula



wherein,

M is hydrogen or is a lithium, potassium, sodium, ammonium, tetramethylammonium, tetraethylammonium, tetrabutylammonium, tributylammonium, trimethylammonium, triethylammonium, tribenzylammonium, trihexylammonium, trimethylphenylammonium or triphenylammonium;

R_1 is hydrogen, a carboxylic acid protecting group, lithium, potassium, sodium, ammonium, tetramethylammonium, tetraethylammonium, tetrabutylammonium, tributylammonium, trimethylammonium, triethylammonium, tribenzylammonium, trihexylammonium, trimethylphenylammonium or triphenylammonium;

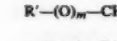
R_2 is

a. C_1 to C_7 alkyl, C_3 to C_7 alkenyl, chloromethyl, dichloromethyl, 4-carboxybutyl, 4-formylbutyl, 4-amino-4-carboxybutyl, 4-formylbutyl, 4-amino-4-carboxybutyl, 4-protected carboxybutyl, or 4-protected amino-4-protected carboxybutyl; or

b. C_1 to C_6 alkoxy, C_3 to C_6 cycloalkyloxy, benzyloxy or substituted benzyloxy, wherein the substituents are one to three groups chosen from the group consisting of C_1 to C_4 alkyl, C_1 to C_4 alkoxy or chloro; or

c. 1,4-cyclohexadienyl, phenyl or substituted phenyl, wherein the substituents are one or two groups chosen from the group consisting of chlorine, bromine, hydroxy, trifluoromethyl, C_1 to C_4 alkyl, C_1 to C_4 alkoxy, carboxy, carboxymethyl, hydroxymethyl, aminomethyl and protected aminomethyl; or

d. a group of the formula

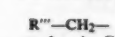


wherein R′ is 1,4-cyclohexadienyl, phenyl or substituted phenyl as defined above, and m is 0 or 1; or

e. a group of the formula

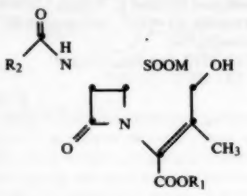
wherein R″ is R′ as defined above, 2-thienyl, or 3-thienyl; W is hydroxy, carboxy, protected carboxy, amino or protected amino; or

f. a heteroarylmethyl group of the formula



wherein R‴ is 2-thienyl, 3-thienyl, 2-furyl, 3-furyl, 2-thiazolyl, 5-tetrazolyl or 1-tetrazolyl;

with the limitation that when the compound is of the formula



R_2 is 1,4-cyclohexadienyl, phenyl or substituted phenyl, wherein the substituents are one or two groups chosen from the group consisting of chlorine, bromine, hydroxy, trifluoromethyl, C_1 to C_4 alkyl, C_1 to C_4 alkoxy, carboxy, carboxymethyl, hydroxymethyl, aminomethyl and protected aminomethyl.

4,537,721

CU-PC DYESTUFFS

Manfred Groll, Leverkusen, and Dieter Ockelmann, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

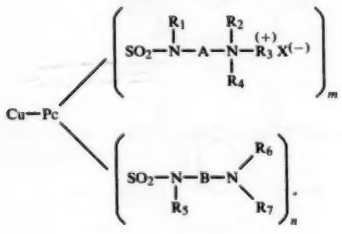
Filed Dec. 14, 1983, Ser. No. 561,609

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1982, 3248466

Int. Cl.³ C09B *47/32*

U.S. Cl. 260—242.2 **6 Claims**

1. Basic copper phthalocyanine dyestuffs of the general formula



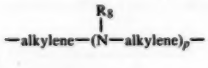
(I)

in which

Cu-Pc denotes the radical of an m+n-valent copper phthalocyanine radical,

A denotes alkylene

B denotes a radical of the formula



R_1 denotes hydrogen or alkyl,

R_2, R_3 and R_4, independently of one another, denote alkyl which can be substituted by hydroxyl or alkoxy groups,

R_5 denotes hydrogen, alkyl or aminoalkyl,

R_6 and R_7, independently of each other, denote hydrogen or alkyl which can be substituted by hydroxyl, alkoxy or amino groups, and

R_8 denotes hydrogen or alkyl, or

R_1 can form a closed ring with R_2,

R_2 can form a closed ring with R_3,

R_5 can form a closed ring with R_6 and/or

R_6 can form a closed ring with R_7,

m denotes a number from 1.0 to 2.5,

n denotes a number from 0 to 1.4, but is 0 only if R_2 forms a closed ring with R_3,

m+n is 1.8 to 2.5,

p denotes 0, 1, 2 or 3 and

$X^{(-)}$ denotes an anion.

4,537,722

STEROID ESTERS PREPARATION

Anders R. Stamvik; Sten K. Kristensson, both of Helsingborg, and Karl-Erik Lundvall, Ängelholm, all of Sweden, assignors to Ab Leo, Helsingborg, Sweden

Filed May 29, 1984, Ser. No. 614,991

Claims priority, application Sweden, May 30, 1983, 8303031

Int. Cl.³ C07J *17/00*

U.S. Cl. 260—397.4 **19 Claims**

1. A process for the preparation of a steroid carboxylic acid ester of high purity and in improved yield and colour, comprising reacting in an inert organic solvent, which is nonreactive with the reactants and the reaction products under the condition of the reaction, a carboxylic acid, a steroid hydroxyl compound which has a cyclopentanophenanthrene carbon-carbon skeleton and contains up to a maximum of 40 carbon atoms, and which is selected from the group consisting of steroid primary or secondary alcohols and phenols, and a carbodiimide, in the presence of a combination of a 4-(tertiary amino)-pyridine and a strong acid.

4,537,723

DERIVATIVES OF LEUKOTRIENES A AND C

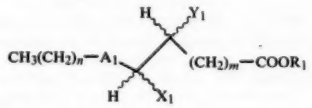
William P. Schneider, Kalamazoo Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 345,896, Feb. 4, 1982, abandoned. This application Oct. 24, 1983, Ser. No. 545,107

Int. Cl.³ C07C *163/00, 149/40*

U.S. Cl. 260—400 **5 Claims**

1. A compound of the formula II



wherein A_1 is

(1) $—CH_2—CH_2—$, or

(2) trans—CH=CH—;

wherein R_1 is

(1) hydrogen,

(2) C_1–C_3 alkyl, or

(3) a pharmacologically acceptable cation;

wherein one of X_1 and Y_1 is hydroxy and the other is

(1) $—S—C_6H_5$, or

(2) $—SeC_6H_5$;

wherein m is an integer from 3 to 7, inclusive; and

wherein n is an integer from 7 to 13, inclusive.

4,537,724

ALKANOYLOXYBENZENESULFONATE SALT PRODUCTION

Bonnie G. McKinnie, and Gene C. Robinson, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed May 11, 1983, Ser. No. 493,452

Int. Cl.³ C07C *143/90*; C11D *1/28*

U.S. Cl. 260—400 **20 Claims**

1. A process for the preparation of an alkali metal or an alkaline earth metal salt of an acyloxybenzenesulfonic acid which comprises reacting at elevated temperature in the range of about 200° to about 350° C. the corresponding hydroxybenzenesulfonate salt with an aryl ester of an aliphatic carboxylic acid.

4,537,725
DIARYLIODOSYL SALTS

Edward Irving, Burwell, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

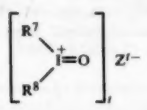
Filed Sep. 9, 1983, Ser. No. 530,801

Claims priority, application United Kingdom, Sep. 18, 1982, 8226706; Jun. 10, 1983, 8315925

Int. Cl.³ C07F *15/02, 7/22, 9/68, 9/92*

U.S. Cl. 556—138 **18 Claims**

1. A diaryliodosyl salt of formula



IV

wherein

R^7 and R^8, which are the same or different, represent phenyl, naphthyl or said phenyl or said naphthyl substituted by one or two groups selected from the group consisting of alkoxy of 1 to 4 carbon atoms, alkyl of 1 to 4 carbon atoms, phenyl, nitro and halogen,

Z^{t-} denotes a t-valent anion of formula MX_n— or R^9SO_3— or is a t-valent anion selected from the group consisting of phosphate, hydrogenphosphate, dihydrogenphosphate, sulfate and hydrogensulfate,

t is 1, 2 or 3,

M represents antimony, bismuth, tin, boron, iron, arsenic or phosphorus,

X represents fluoro or chloro,

n is 4, 5 or 6, and is one more than the valency of M,

with the proviso that, when M represents antimony, n is 6 and five of X are each fluoro and the other X represents fluoro or hydroxo, and

R^9 represents methyl, trifluoromethyl, phenyl or said phenyl substituted by alkyl of 1 to 4 carbon atoms or by halogen.

4,537,726
MULTI-STAGE PROCESS WITH ADIABATIC REACTORS FOR THE PREPARATION OF ISOCYANATES

Velliyur N. M. Rao, Wilmington, Del., and George E. Heinsohn, Elkton, Md., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 9, 1984, Ser. No. 669,850

Int. Cl.³ C07C *118/04*

U.S. Cl. 260—453 P **8 Claims**

1. An improved process for the preparation of isocyanates of the formula $R—(NCO)_n$ where R is a C_1–C_{10} alkyl, cycloalkyl, aryl, alkaryl, or aralkyl group and n is 1 or 2, by reacting a corresponding formamide of the Formula $R(NH—CO—H)_n$ with oxygen or an oxygen-containing gas at 400°–700° C. in the presence of a silver catalyst, wherein the improvement comprises performing the reaction in at least two essentially adiabatic reaction stages in series and wherein the improvement is characterized by:

(a) introducing the formamide and up to 70% of the stoichiometric amount of oxygen to the first reaction stage at a temperature sufficiently low to maintain the temperature of the reaction in the first stage at 700° C. or below;

(b) introducing additional oxygen to the reaction mixture effluent of each non-final stage; and

(c) introducing the resultant reaction mixture of step (b) to the succeeding reaction stage at a temperature sufficiently low to maintain the temperature of the reaction in the succceeding stage at 700° C. or below.

4,537,727
PROCESS FOR RECOVERING 2-ACETYLTHIOMETHYL-5-AMINOPENTANOIC ACID

Russell L. Barton, Indianapolis; Stephen L. Briggs, Clayton, and Gary A. Koppel, Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 12, 1982, Ser. No. 441,139

Int. Cl.³ C07C *153/017*

U.S. Cl. 260—455 R **6 Claims**

1. A process for recovering 2-acetylthiomethyl-5-aminopentanoic acid of increased purity from an impure acid addition salt thereof, which comprises treating the impure acid addition salt in a polar organic solvent selected from the group consisting of a nitrile, an alcohol, a glycol, nitromethane, nitrobenzene, and an amide with a base selected from the group consisting of an alkoxide and an amine.

4,537,728
FLUORINATED AND NON-FLUORINATED TERMINALLY HALOGENATED ALKYL PYROMELLITATES

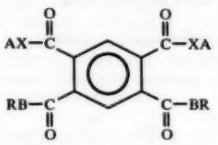
Bryce C. Oxenrider, Florham Park, and David J. Long, Stanhope, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Sep. 30, 1982, Ser. No. 431,452

Int. Cl.³ C07C *153/07, 69/76, 101/20, 101/24, 101/26*

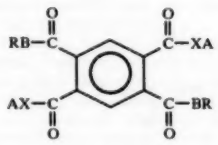
U.S. Cl. 260—455 R **15 Claims**

1. A monocyclic compound having the structure:



(I)

or



(II)

or mixtures thereof wherein X is independently at each occurrence —O—, —S—, —N(CH₃)— or —NH—; wherein A is alkyl of 2–24 carbons or R′—$(CF_2)_pCF_3$ with R′ being alkylene of 1–6 carbons and p being an integer of 3–15; wherein B is —O—, —S—, —NH—, or —N(CH₃)—; wherein R is $(CH_2)_nQ$ or $(CH_2)_mCH_2$ with n being an integer of 2–10, m being an integer of 0–10, and z being an integer of 1–5; wherein Q is Cl or Br.

4,537,729
DIMETHYLPHOSPHORAMIDATES

Gordon W. Rewcastle; Graham J. Atwell; Bruce C. Baguley, and William A. Denny, all of Auckland, New Zealand, assignors to Development of Finance Corporation of New Zealand, Wellington, New Zealand

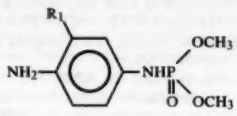
Division of Ser. No. 409,594, Aug. 19, 1982, Pat. No. 4,479,000. This application Apr. 5, 1984, Ser. No. 597,236

Claims priority, application New Zealand, Aug. 21, 1981, 198115

Int. Cl.³ C07F *9/24*

U.S. Cl. 260—944 **1 Claim**

1. A compound of the general formula (III):



III

where R_1 is H or OCH_3.

4,537,730
PREPARATION OF O,S-DIMETHYL-THIOLOPHOSPHORIC ACID AMIDE

Peter Feyen, Mettmann; Hermann Seifert, Cologne, and Egon Kohler, Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

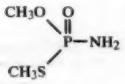
Filed Jul. 21, 1983, Ser. No. 516,167

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1982, 3228868

Int. Cl.³ C07F 9/24

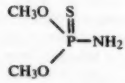
U.S. Cl. 260—989 18 Claims

1. A process for the preparation of O,S-diemthylthiolophosphoric acid amide of the formula

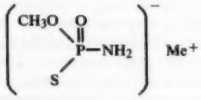


comprising

(a) contacting O,O-dimethyl-thiophosphoric acid amide of the formula



with an aqueous solution of KOH or NaOH, in the presence of a sparingly water-miscible organic solvent selected from the group consisting of chlorobenzene, xylene and toluene, thereby to form the salt of the formula



in which

Me is sodium or potassium, separating the aqueous phase,

(b) optionally adding an organic solvent to the aqueous phase, and reacting the mass with methyl bromide or methyl chloride thereby to form the O,S-dimethyl-thiolphosphoric acid amide, and

(c) extracting the amide with a solvent selected from the group consisting of isobutanol, n-butanol and isopropanol thereby to dissolve the amide.

4,537,731
SADDLE FILLING MEMBER FOR GAS-LIQUID CONTACT

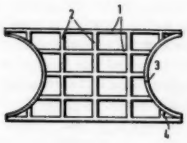
Reinhard Billet, Bochum; Rainer Kober, Steinwiesen; Jerzy Makowiak, Bochum, and Werner Geipel, Steinwiesen, all of Fed. Rep. of Germany, assignors to Paul Rauschert GmbH & Co. KG, Pressig, Fed. Rep. of Germany

Filed May 26, 1983, Ser. No. 498,557

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1982, 32211309

Int. Cl.³ B01F 3/04

U.S. Cl. 261—94 6 Claims



1. A saddle filling member for gas-liquid contact, characterized in that it comprises a plurality of first ribs which are arranged parallel to each other and which are arcuately curved towards one side, and a plurality of second ribs which are arranged parallel to each other and normal to the first ribs and which are arcuately curved towards the opposite side, and also two arcuately curved connecting web portions which interconnect the end regions of the first ribs, the ribs being of a sharp-edged configuration and forming with said connecting web portions a grid-like structure over all the surfaces of said member.

4,537,732
SYSTEM AND PROCESS FOR PRODUCING MOLDED OPTICAL ELEMENTS

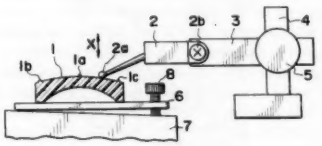
Hiroshi Ueda, Nara; Mitsuru Saito, Kaizuka, and Hideo Kajita, Chihayaakasaka, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 156,064, Jun. 2, 1980, abandoned. This application May 17, 1984, Ser. No. 612,062

Claims priority, application Japan, Jun. 19, 1979, 54-77714

Int. Cl.³ B29D 11/00

U.S. Cl. 264—1.1 17 Claims



1. A process for mass manufacturing of optical elements and inspecting the accuracy of their optical surfaces, comprising the steps of:

molding a curved optical body to have a curved optical surface with an integral indexing means on a predetermined position, located at a fixed relative position to a predetermined optical axis of the optical surface, the indexing means forming at least one discontinuity of a predetermined surface configuration of sufficient magnitude for measurement but limited in size to prevent any perceptible aberration to be introduced within the desired application of the optical element;

positioning the molded optical body in an operative position

relative to a measuring instrument that directly contacts the optical surface;

measuring the optical body to provide a measurement of the optical surface including a measurement of the indexing means to insure a proper alignment, and

comparing the measurement with a standard reference model measurement to evaluate acceptable surface accuracy.

17. A production system for the inspection of the accuracy of optical surfaces, comprising:

a die cavity for molding a curved optical body to have a curved optical surface with an integral indexing means on a predetermined position, located at a fixed relative position to a predetermined optical axis of the optical surface, the indexing means forming at least one discontinuity of a predetermined surface configuration of sufficient magnitude for measurement but limited in size to prevent any perceptible aberration to be introduced within the desired application of the optical element;

means for positioning a molded optical body in an operative position relative to a measuring instrument that directly contacts the optical surface;

means for measuring the optical body to provide a measurement of the optical surface including a measurement of the indexing means to insure a proper alignment, and

means for comparing the measurement with a standard reference model measurement to evaluate acceptable surface accuracy.

4,537,733

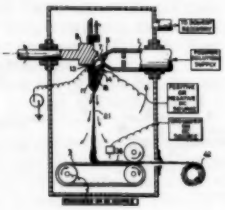
NONWOVEN FIBER-SHEET PROCESS

John Farago, Richmond, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 31, 1983, Ser. No. 547,384

Int. Cl.³ B29C *6/00*

U.S. Cl. 264—9 **4 Claims**



1. In a process for making a wide nonwoven fiber sheet wherein a fiber stream issues from each of a plurality of positions located above a moving receiver and along a line that makes an angle with the direction of receiver movement, each fiber stream being oscillated as it is forwarded to the receiver whereon it deposits fiber to form a ribbon which is lapped with ribbons from preceding and succeeding positions along the line, the improvement comprising varying the oscillation frequency of every other fiber stream along the line by more than ±5%, but less than ±50%, of the average oscillation frequency, the variation in oscillation frequency having a period in the range of 1 to 120 seconds.

4,537,734

METHOD FOR REDUCING THE MONOMER CONTENT IN ACRYLONITRILE CONTAINING POLYMERS

Kennard H. Morganstern, Roslyn, N.Y., assignor to Radiation Dynamics, Inc., Melville, N.Y.

Continuation-in-part of Ser. No. 4,046, Jan. 17, 1979, abandoned, which is a continuation of Ser. No. 840,415, Oct. 7, 1977, abandoned. This application Mar. 12, 1979, Ser. No. 19,616

Int. Cl.³ C08F *6/28, 220/44;* **C08J** *3/28, 7/10*

U.S. Cl. 264—22 **16 Claims**

1. A method for reducing the acrylonitrile monomer content in an acrylonitrile polymer which comprises exposing the polymer to ionizing radiation at an irradiation dosage level of from about 0.050–2.0 megarads at a rate sufficient to significantly reduce the extractable residual acrylonitrile monomer content in the polymer, wherein the polymer is not at or above its softening point during exposure to said ionizing radiation.

4,537,735

METHOD OF PRODUCING A SILICON CARBIDE SINTERED COMPACT

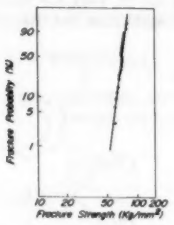
Ryo Enomoto, and Kiyotaka Tsukada, both of Oogaki, Japan, assignors to Ibiden Kabushiki Kaisha, Oogaki, Japan

Filed Mar. 28, 1983, Ser. No. 479,331

Claims priority, application Japan, Mar. 29, 1982, 57-48957

Int. Cl.³ C04B *35/56*

U.S. Cl. 264—63 **4 Claims**



1. In a method of producing a silicon carbide sintered compact comprising steps of placing silicon carbide fines, at least one sintering additive selected from a group consisting of boron containing additives, carbonaceous additives, beryllium containing additives and aluminum containing additives, and at least one shaping additive selected from a group consisting of polyethylene glycol, magnesium stearate, barium stearate, aluminum stearate, zinc stearate, stearic acid, starch, dextrin, gum arabic, casein, sugar, molasses, na-carboxymethyl cellulose, methyl cellulose, polyvinyl alcohol, polyvinyl methyl ether, polyacrylic amide, tannic acid, liquid paraffin, wax emulsion, ethyl cellulose, polyvinyl acetate, phenol resin, cellulose acetate, glycerol and polyethylene glycol, as required into a dispersing medium solution of water or organic liquid to form a suspensoid, performing a sieving operation of said suspensoid, processing and forming said suspensoid into a green compact from powders obtained in said sieving operation, and subjecting said green compact to a pressureless sintering process to produce a sintered compact:

the improvement comprising limiting the solid content comprising said silicon carbide fines and sintering additive within a range of 10–50% by volume to said suspensoid; when water is used as said dispersing medium solution, adding and dispersing at least one of the dispersing agents in the following group A, while when an organic liquid is used as said dispersing medium solution, adding and dispersing at least one of the dispersing agents in the following group B, in said solution to form a suspensoid, said organic liquid being selected from a group consisting of acetone, methenol, ethanol, butanol, hexane, heptane,

nonane, toluene, xylene, ethyl methyl ketone, methyl isobutyl ketone, ethyl benzene, ethylene glycol, trichloroethylene, cyclohexane, nitromethane, nitroethane, isopropyl alcohol, benzene and carbon tetrachloride; applying a pressure differential to promote the sieving operation retarded by a pressure loss between, before and after said sieve, with or without vibration, to said suspensoid to pass a sieve having an opening less than 65 μm, removing coarse foreign matters which cause pores or inclusion affecting adversely the bending strength of said compact;

A. amines, organic compounds containing carboxyl group, organic compounds containing sulfo group, esters, ammonium compounds, organic compounds containing ether linkage, carboxylic acid salts, aluminates, phosphates, phosphoric acid complex salts, sulfonates and silicates;

B. amines, organic compounds containing carboxyl group, organic compounds containing sulfo group and esters.

4,537,736

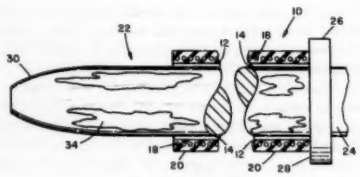
METHOD FOR CURING A FLEXIBLE HOSE

William S. Peltzman, Northglenn; Raymond A. Rohlfing, and Charles C. Gates, Jr., both of Denver, all of Colo., assignors to The Gates Rubber Company, Denver, Colo.

Division of Ser. No. 385,169, Jun. 4, 1982, abandoned. This application Dec. 5, 1983, Ser. No. 544,026

Int. Cl.³ B29C *25/00*

U.S. Cl. 264—130 **6 Claims**



1. A method for heat curing a flexible hose using a curved metallic mandrel comprising the steps of:

extruding an elastomeric tube that is heat curable at temperatures from about 200° F. to about 400° F. while simultaneously:

heating a remeltable material characterized as pliant while in solid form and lubricious while in melted form;

melting the material starting at a temperature below about 210° F.; and

coating at least a portion of an inside of the tube and forming a layer of melted material;

cooling the tube while simultaneously solidifying the material and forming a layer of solidified material;

heating a curved mandrel to a temperature that is above the material melting temperature, the mandrel of appropriate size to fit inside the tube;

pushing and sliding a length of tube over the mandrel while simultaneously remelting the layer of solidified material with the heated mandrel and thereby lubricating the mandrel with the remelted material for easily receiving the length of tube;

curing the length of tube on the heated mandrel;

pulling and sliding the cured length of tube from the mandrel while the mandrel and tube are hot and the layer of material is still melted and in lubricious form; and

cooling the cured length of tube.

4,537,737

METHOD AND EQUIPMENT FOR PROCESSING A PLASTICIZABLE MATERIAL

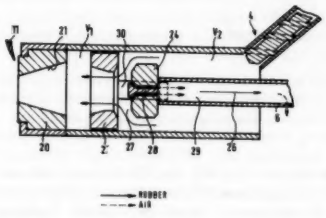
Anthony Crowe, Langgarbenstrasse 18, CH-4416 Bubendorf, Switzerland

Filed Sep. 13, 1983, Ser. No. 531,761

Claims priority, application Switzerland, Oct. 1, 1982, 5814/82

Int. Cl.³ B29C *17/00*

U.S. Cl. 264—40.4 **3 Claims**



1. A preformer for processing rubber compounds into a semi-finished rubber blank, whereby the rubber compound which is preheated and plasticised by kneading and finally is extruded through a die out of cylinder using a piston and is cut in exact metered volumes, characterized by the fact that a piston extruder (**2**) has at its free end a die (**20**) as well as inside of a cylinder (**19**) there is a movable piston (**5**), whereby the piston is connected to a drive (**6**), with the purpose of moving the piston back and forwards and further a feed and plasticising unit (**4**) is provided, which fits into the cylinder (**19**), so that the cold material fed into the feed and plasticising unit (**4**) is only preheated and plasticised shortly before entry into the cylinder (**19**) and thereafter can be pressed through the piston head, the piston (**5**) containing a non-return valve (**23,24**), which permits during operation the transfer of material fed into the cylinder (**2**) from one cylinder side (V2) to the other (V1), but only during the return stroke of the piston, whereby in the cylinder part (V2) which lies at the opposite end to the die (**20**), said feed and plasticiser unit (**4**) feeds in a way that the rubber compound shortly before entering the extrusion cylinder (**2**) is preheated and plasticised, the piston rod (**6**) containing a hole to which is connected on one side a vacuum source, on the other side a non-return value (**28**), which opens to the die side of the cylinder (V1), so that the air in the cylinder area is sucked out.

2. A method for the processing of a rubber compound from raw rubber material to produce a semi-finished rubber blank, the steps comprising

feeding and plasticising the rubber compound in a cold state in a feed and plasticiser unit,

preheating by kneading and plasticising and finally extruding the rubber compound out of a cylinder and through a die by means of a piston,

transferring material fed during operation into the cylinder from one cylinder side which lies at the opposite end to the die to the other cylinder side by means of a non-return valve of the piston unit feeding the rubber compound into the cylinder shortly after the rubber compound has been heated and plasticised, and

cutting the rubber compound into exact metered volumes.

4,537,738

PROCESS FOR ORIENTING PARTIALLY CRYSTALLIZED 3-HYDROXYBUTYRATE POLYMERS

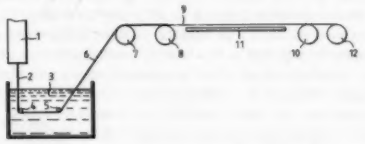
Paul A. Holmes, Middlesbrough, England, assignor to Imperial Chemical Industries PLC, Lordon, England

Filed Aug. 18, 1983, Ser. No. 524,314

Claims priority, application United Kingdom, Aug. 27, 1982, 8224683

Int. Cl.³ D01D *5/12*

U.S. Cl. 264—210.5 **8 Claims**



1. A process for the production of an oriented shaped article from a polymer containing at least 40 mole % of 3-hydroxybutyrate residues in the polymer chain comprising uni- or bi-axially drawing a preform of said hydroxybutyrate polymer in a partially crystalline state at a temperature between the glass transition temperature, Tg, and the melting point of the hydroxybutyrate polymer into said shaped article, and then increasing the degree of crystallinity of the hydroxybutyrate polymer by subjecting the drawn preform, while in the drawn condition, to a temperature between the glass transition temperature and the drawing temperature until the drawn article is nonrubbery, the amount of said uni- or bi-axial drawing being such that, after said step of increasing the degree of crystallinity, at least one dimension of the preform has increased by at least 200%, said hydroxybutyrate polymer having a degree of crystallinity, at the time of drawing, such that the preform is not so brittle that it breaks before achieving said increase in said at least one dimension, and such that the drawn article does not break during the step of increasing the degree of crystallinity.

4,537,739

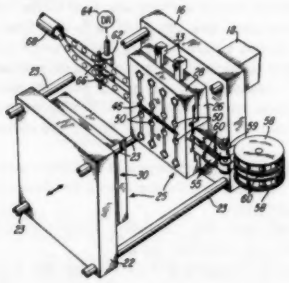
PRODUCTION OF MOLDED PLASTIC ARTICLES WITH ARTWORK THEREON

Gerald F. Ruhl, Greenville, Ohio, assignor to Replicap Products, Inc., Greenville, Ohio

Filed Aug. 22, 1983, Ser. No. 524,935

Int. Cl.³ B29C *1/00, 9/00*; B29F *1/00*

U.S. Cl. 264—247 **9 Claims**



1. A method of producing articles of molded plastics material with each article having thereon a decorative coating according to predetermined artwork, comprising the steps of forming on a first mold section and a second mold section corresponding surfaces cooperating to define a primary portion of at least one mold cavity corresponding to the shape of the article, positioning adjacent the second mold section a mold plate having a generally flat surface defining a secondary portion of the cavity and substantially coextensive with the cavity, supporting the first and second mold sections for relative movement between open and closed positions, supporting the second mold section and the mold plate for relative movement between a clamped position and a released position defining a clearance space therebetween, providing an elongated flexible carrier strip releasably supporting a layer of heat responsive transfer material, directing the carrier strip through the clearance space and along a path adjacent the mold plate surface and the cavity, clamping the carrier strip between the mold plate surface and the second mold section when the mold plate and the second mold secton are in the clamped position, injecting a molten plastics material into the mold cavity remote from the surface of the mold plate and into contact with the layer of transfer material on the carrier strip adjacent the mold plate surface to form an article within the cavity and to transfer a portion of the layer of transfer material from the carrier strip to the article while the corresponding portion of the carrier strip remains in contact with the generally flat mold plate surface, and pulling the carrier strip longitudinally through the clearance space when the mold plate and the second mold section are in the released position to advance the carrier strip and position another portion of the layer of transfer material adjacent the mold cavity.

4. Apparatus for producing articles of molded plastics material with each article having thereon a decorative coating according to predetermined artwork, comprising a mold including a first mold section and a second mold section having corresponding surfaces cooperating to define a portion of at least one mold cavity corresponding to the shape of the article, a mold plate disposed adjacent said second mold section and having a generally flat surface also defining a portion of said cavity and substantially coextensive with said cavity, means supporting said first and second mold sections for relative movement between open and closed positions, means supporting said second mold section and said mold plate for relative movement between a clamped position and a released position defining a clearance space therebetween, an elongated flexible carrier strip releasably supporting a layer of heat responsive transfer material, means for directing said carrier strip through said clearance space and along a path adjacent said mold plate surface and said cavity, said carrier strip being clamped between said mold plate surface and said second mold section when said mold plate and said second mold section are in said clamped position, means for injecting a molten plastics material into said mold cavity remote from said surface on said mold plate and into contact with said layer of transfer material on said carrier strip adjacent said mold plate surface to form an article within said cavity and to transfer a portion of said layer of transfer material from said carrier strip to the article while the corresponding portion of said carrier strip remains in contact with said mold plate surface, and means for pulling said carrier strip longitudinally through said clearance space when said mold plate and said second mold section are in the said released position to advance said carrier strip and position another portion of the said layer of transfer material adjacent said mold cavity.

4,537,740

FISSION GAS DETECTION SYSTEM

Richard P. Colburn, Pasco, Wash., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 31, 1983, Ser. No. 480,961

Int. Cl.³ G21C *17/00*

U.S. Cl. 376—256 **6 Claims**

6. A device for monitoring a nuclear fuel assembly for rod cladding failure and subsequent fission gas release which comprises:

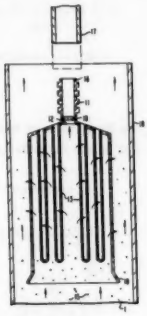
(a) a path for passage of a portion of coolant flow after passage through said fuel assembly;

(b) a first filter in said path having holes adapted to pass

coolant therethrough but sufficiently small to prevent passage of entrained fission gas bubbles, said filter holes having a diameter ranging from about 10 μm to 100 μm;

(c) a plenum located within said path to gather fission gas bubbles which are denied passage through said first filter;

(d) a second small filter located in said path, such that a portion of coolant flow through said first filter passes



through said second small filter and second filter located adjacent to said plenum such that said second small filter becomes gas blanketed by fission gas bubbles which gather in said plenum when cladding failure occurs; and

(e) means for monitoring coolant flow through said second small filter, such flow indicative of cladding failure since the gas blanketing of said second filter by fission gas then released reduces said flow.

4,537,741

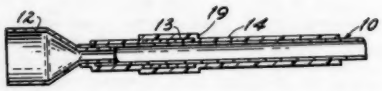
FUNNEL FOR FUEL PIN LOADING SYSTEM

David W. Christiansen, Kennewick; Jim M. Steffen, Richland, and William F. Brown, West Richland, all of Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 30, 1982, Ser. No. 445,605

Int. Cl.³ G21C *19/00*

U.S. Cl. 376—261 **7 Claims**



1. In combination with a length of tubular fuel cladding for a nuclear reactor, in which the cladding has an open axial end;

a funnel mounted to the open axial end of the cladding, said funnel having an enlarged outer open end leading to a reduced diameter neck that is at least partially inserted within the open axial end of the cladding as a coaxial outwardly protruding attachment;

and a continuous length of tubing shrunk about both the cladding and funnel to grip and maintain them as a unit during handling of the unfilled cladding and reception of fuel into the cladding through the attached funnel.

4,537,742

METHOD FOR CONTROLLING DIMENSIONS OF RSPD ARTICLES

Paul A. Siemers, Clifton Park; Robert W. Kopp, Ballston Lake, and Melvin R. Jackson, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 28, 1983, Ser. No. 546,234

Int. Cl.³ B22F *3/00*

U.S. Cl. 419—8 **8 Claims**

1. A method of forming an article to close internal dimensions from a difficult to fabricate material which comprises providing the material in a finely divided form, low pressure plasma spraying the material to form a body having a density less than 100% of its theoretical density, and having an internal cavity, providing a densification mandrel having dimensions slightly smaller than the final dimensions to be imparted to said cavity and having a thermal coefficient of expansion greater than that of said body, introducing said densification mandrel into said cavity and heat treating said body and densification mandrel to densify said body and to shrink said body into contact with said mandrel and to impart to said body a set of desired internal dimensions.

4,537,743

ELECTRODE COMPOSITION FOR VACUUM SWITCH

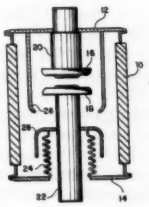
Takashi Yamanaka, Itami; Yasushi Takeya, Osaka; Mitsumasa Yorita, Itami; Toshiaki Horiuchi, Settsu; Kouichi Inagaki, Itami; Eizo Naya, Ibaraki; Michinosuke Demizu, Takarazuka, and Mitsuhiro Okumura, Sakai, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 451,324, Dec. 20, 1982, Pat. No. 4,499,009. This application Jun. 25, 1984, Ser. No. 624,519

Claims priority, application Japan, Dec. 21, 1981, 56-208687

Int. Cl.³ B22F *1/04*

U.S. Cl. 419—38 **2 Claims**



1. An electrode for a vacuum switch, said electrode being produced by subjecting a composition consisting essentially of:

(a) not more than 20% by weight of at least one low melting point metal selected from the group consisting of bismuth (Bi), lead (Pb), indium (In), lithium (Li), tin (Sn) and alloys thereof;

(b) not more than 10% by weight of a metal capable of forming an alloy with said low melting point metal at a temperature not less than the melting point of said low melting point metal, and being alloyable with copper at a temperature not higher than the melting point of said alloy, selected from the group consisting of tellurium (Te), antimony (Sb), lanthanum (La), magnesium (Mg) and alloys thereof; and

(c) the balance being copper (Cu)

to a powder metallurgical technique which comprises mixing components (a), (b) and (c) in powder form, molding the resultant mixture into a predetermined electrode shape and sintering the resultant shape in a furnace at a temperature not higher than the melting point of copper in an atmosphere of substantially pure hydrogen.

4,537,744

HIGH-TEMPERATURE PROTECTION LAYER

Franz Gross, Neckargemünd; Georg Wahl, Eppelheim, and Andrew R. Nicoll, Oftersheim, all of Fed. Rep. of Germany, assignors to BBC Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed Nov. 30, 1983, Ser. No. 556,639

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1982, 3246507

Int. Cl.[3] C22C *19/05*

U.S. Cl. 420—446 4 Claims

1. High-temperature protection layer for protecting structural elements of austenitic material subjected to temperatures below and above 900° C., of an alloy applied to the austenitic structural material, said alloy having a base material containing at least 8 to 12 atom % aluminum, 18 to 28 atom % chromium, with the remainder nickel and 1 to 6 atom % silicon and 1 to 3 atom % titanium based on the base material of the alloy admixed to the base material as additives to induce a passive cover layer of chromium oxide to develop on the alloy at a temperature below 900° C., and a passive cover layer of aluminum oxide to develop on the alloy at a temperature above 900° C.

4,537,745

METHOD OF PRODUCING COPPER-CHROMIUM FUSION ALLOYS AS CONTACT MATERIAL FOR VACUUM POWER SWITCHES

Heinrich Hässler, Wendelstein; Reiner Müller, Steinbach; Horst Kippenberg, Herzogenaurach, and Norbert Prölss, Wendelstein, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 27, 1984, Ser. No. 574,792

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1983, 3303170

Int. Cl.[3] C22C *1/02*

U.S. Cl. 420—590 22 Claims

1. In a method of producing copper-chromium fusion alloys having a chromium content of at least 25% by mass and at most 60% by mass with a homogeneous macrostructure without lattice defects and without shrink holes or pipes for use as contact material for vacuum power switches with breaking currents above 10 KA, wherein a starting material is prepared for the fusion process from the alloy components copper and chromium and then a melt is formed from this starting material, the improvement comprising the steps of:

(a) superheating at least a partial zone of an instantaneous volume of said melt to at least 2000° C., thereby to fuse the starting material into the fusion alloy; and

(b) rapidly cooling the melt at a non-thermodynamic equilibrium rate such that a primary Cr precipitation or segregation does not occur.

4,537,746

METHODS FOR DISINFECTING AND PRESERVING CONTACT LENSES

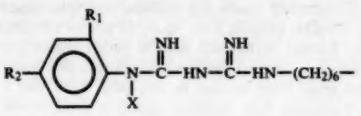
Lai Ogunbiyi, Fairport; Francis L. Scott, Rochester, and Francis X. Smith, Walworth, all of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

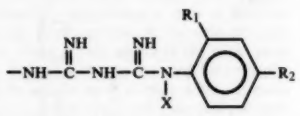
Filed Dec. 29, 1983, Ser. No. 566,833

Int. Cl.[3] A61L *2/16*

U.S. Cl. 422—28 19 Claims

1. A method of disinfecting and/or preserving contact lenses which comprises treating said lenses with an antimicrobial amount of a solution comprising a biguanide or its water soluble salt of the formula:





wherein R_1 and R_2 are hydrogen or halogen and X is hydrogen or alkyl, provided that when R_2 is halogen then R_1 is hydrogen and X is alkyl.

4,537,747

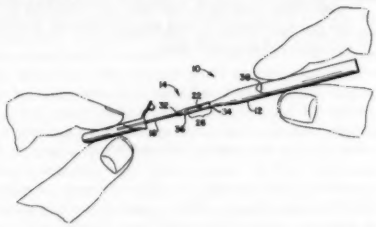
DISPOSABLE DEVICE FOR SAMPLING AND DILUTING

Henry B. Castaneda, Woodbridge, Va., assignor to Chemetrics, Inc., Warrenton, Va.

Filed Mar. 16, 1983, Ser. No. 475,975

Int. Cl.[3] G01N *1/14*

U.S. Cl. 422—100 9 Claims



1. A disposable device for the sampling and diluting of a liquid, comprising a hollow tubular body that includes means for drawing up and capturing by capillary attraction a predetermined volume of a liquid; and that further includes a valveless connecting tube in an air-tight sealing relationship with an upper end of the liquid drawing up and capturing means;

a sealed pre-evacuated container having a fill volume selected to effect a predetermined dilution of the liquid captured by said liquid drawing up and capturing means, said container haivng means for mutually interengaging in an air-tight sealing relationship with said connecting tube;

means for providing ready communication between the interior of said container and said hollow tubular body when said container and said connecting tube are in an air-tight sealing relationship; and

a two-way vent port in a wall of said hollow tubular body for preventing air pressure build-up within said hollow tubular body that would preclude the drawing up of said predetermined volume of said liquid, or that would overcome the capturing capability of said liquid drawing up and capturing means, for readily venting otherwise trapped air from within said hollow tubular body to the ambient atmosphere, and for allowing diluent flow into said hollow tubular body and thereafter into said container other than through said liquid drawing up and capturing means to effect rapid container fill.

4,537,748

APPARATUS FOR TREATING COMPRESSED AIR FOR BREATHING PURPOSES

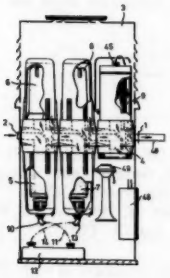
Colin T. Billiet, Durham, England, assignor to Domnick Hunter Filters Ltd., Durham, England

Filed Sep. 9, 1982, Ser. No. 416,306

Claims priority, application United Kingdom, Sep. 11, 1981, 81127557

Int. Cl.³ A62B 7/08

U.S. Cl. 422—122 16 Claims



1. Apparatus for treating a supply of humid contaminated compressed air to render it suitable for breathing purposes, the apparatus comprising: inlet means for receiving compressed air directly from a compressor; a first filter for removing bulk liquids and gross particulate matter; a second filter comprising a soda lime adsorption bed for removing carbon dioxide and acidic fumes; a third coalescing filter for removing oil and water aerosols and sub-micron particulate matter; a fourth filter comprising an activated carbon adsorption bed for removal of hydrocarbon vapors and odors; means for directing the air sequentially through the first, second, third and fourth filters to deliver from the fourth filter a filtered humid air supply substantially devoid of water aerosol; a pressure vessel having an inlet at which said filtered humid air supply is received from said fourth filter via said air delivery means; a bed of granular catalyst material within the pressure vessel, the catalyst material being effective to cause oxidation of carbon monoxide in the air to carbon dioxide; an air passage from the inlet to the catalyst bed; a heater comprising at least one heating element extending within the air passage, the heating element being formed of a material that exhibits a rapid increase in electrical resistance at a temperature of from 101° C. to 110° C.; means for supplying electrical current to the heating element; a temperature sensor immediately downstream of the catalyst bed; control means connected to the sensor and the heater whereby the control means is responsive to the sensor to cause operation of the heater so as to maintain a mean catalyst bed temperature of not less than 100° C. during air passage therethrough; and outlet means within said pressure vessel located downstream of the catalyst bed for passing the relatively high pressure and temperature air from the catalyst bed and out of said pressure vessel, said air, upon cooling and expansion to atmospheric pressure, being suitable for breathing purposes.

4,537,749

PROCESS AND DEVICE FOR STERILIZING TUB-SHAPED CONTAINERS

Werner Hick, Hiddenhausen, Fed. Rep. of Germany, assignor to Hick & Co. GmbH, Hiddenhausen, Fed. Rep. of Germany

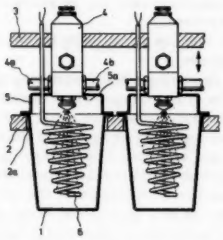
Division of Ser. No. 391,246, Jun. 23, 1982, Pat. No. 4,424,189.

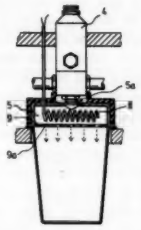
This application Jun. 27, 1983, Ser. No. 507,924

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1981, 3125430

Int. Cl.³ A61L 2/04, 2/18

U.S. Cl. 422—304 7 Claims





1. Apparatus for sterilizing open-topped containers comprising:

conveyor means for supporting containers to be sterilized, said conveyor means moving containers to be sterilized in a first direction along a path;

nozzle means for producing an atomized spray of a liquid delivered thereto, said nozzle means defining a spray discharge path having an axis;

cap means, said cap means being hermetically affixed to said nozzle means;

means for delivering a liquid sterilizing agent capable of the formation of free oxygen upon thermal decomposition to said nozzle means whereby said nozzle means will discharge an atomized spray of said sterilizing agent;

heater means, said heater means having a heating element with a surface which is at a temperature above the thermal decomposition temperature of the sterilizing agent;

support means for said nozzle and heater means, said support means positioning said heater means so that said heater means heating element extends across said nozzle means spray discharge path and intersects the axis thereof so that the spray discharged from said nozzle means will impinge upon said heater means heating element surface whereby said sterilizing agent will undergo instantaneous thermal decomposition; and

means for moving said support means relative to said conveyor means in a second direction which is at an angle relative to said first direction whereby said cap means may be selectively positioned either at a first location spaced from the open top of a container to be sterilized or at a second location sealing the open top of a container to be sterilized, an atomized spray of said sterilizing agent dis-

charged from said nozzle means with said cap at said second location impinging upon said heater means heating element surface in the vicinity of a container to be sterilized, the internal surface of a container thus being sterilized by the combined effects of the free oxygen produced during the instantaneous thermal decomposition of said atomized sterilizing agent and of the sterilizing agent which condenses on the internal surface of a container to be sterilized.

5. Apparatus for sterilizing open-topped containers comprising:

conveyor means for supporting containers to be sterilized, said conveyor means moving containers to be sterilized in a first direction along a path;

nozzle means for producing an atomized spray of a liquid delivered thereto;

cap means, said cap means being hermetically affixed to said nozzle means;

means for delivering a liquid sterilizing agent capable of the formation of free oxygen upon thermal decomposition to said nozzle means whereby said nozzle means will discharge an atomized spray of said sterilizing agent;

heater means, said heater means having a heating element with a surface which is at a temperature above the thermal decomposition temperature of the sterilizing agent, said heater means heating element being at least partly positioned downstream of said nozzle means in the direction of travel of the spray discharged from said nozzle means, said heater means heating element extending beyond said cap means in the direction of travel of the spray discharged from said nozzle means;

support means for said nozzle means and heater means; and

means for moving said support means relative to said conveyor means in a second direction which is generally perpendicular to said first direction whereby said cap means may be selectively positioned either at a first location spaced from the open top of a container to be sterilized or at a second location sealing the open top of a container to be sterilized, said heater means heating element surface being at least partly positioned within a container to be sterilized when said cap means is in said second location whereby the spray discharged from said nozzle means will impinge upon said heater means heating element surface and the atomized sterilizing agent will thereupon undergo instantaneous thermal decomposition in the vicinity of container to be sterilized, the internal surfaces of a container thus being sterilized by the combined effects of the free oxygen produced during thermal decomposition of the atomized sterilizing agent and the sterilizing agent which condenses on the internal surfaces of a container to be sterilized.

4,537,750

PROCESS FOR PRODUCING HIGH PURITY TANTALUM OXIDE

Joseph E. Ritsko, and Howard L. Acla, both of Towanda, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Feb. 29, 1984, Ser. No. 584,848

Int. Cl.³ C01G *35/00*

U.S. Cl. 423—65 **10 Claims**

1. A process for producing optical grade tantalum oxide from an impure tantalum oxide, said process comprising:

(a) contacting said impure tantalum oxide with an aqueous solution of hydrofluoric acid of sufficient strength to solubilize said impure tantalum oxide,

(b) separating said aqueous solution of hydrofluoric acid containing the tantalum values from any insolubles,

(c) adjusting the pH of said aqueous solution of hydrofluoric acid containing said tantalum values to from about 6.0 to about 8.0 with a base to precipitate the tantalum values,

(d) separating the precipitate of tantalum values from the pH adjusted aqueous hydrofluoric acid mother liquor,

(e) contacting said precipitate of tantalum with an oxalic acid solution of sufficient strength to dissolve said precipitate of tantalum,

(f) adjusting the pH of the oxalic acid solution containing the tantalum values to from about 5.1 to about 5.5,

(g) digesting the resulting oxalate solution containing the tantalum values at above about 80° C. for a sufficient time to produce a high purity compound of tantalum,

(h) separating said high purity compound of tantalum from the oxalate solution mother liquor and,

(i) digesting said high purity compound of tantalum in an aqueous solution of hydrochloric acid having a strength of from about 1N to about 10N, at a sufficient temperature and for a sufficient time to dissolve said high purity compound of tantalum in said aqueous solution of hydrochloric acid and continuing digesting for a sufficient time to subsequently precipitate pure optical grade tantalum oxide and,

(j) separating said precipitate from the hydrochloric acid mother liquor.

4,537,751

TREATMENT OF ALUMINA-BASE CATALYSTS

Paul J. Marcantonio, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Mar. 28, 1984, Ser. No. 594,078

Int. Cl.³ C01F *7/02*

U.S. Cl. 423—114 **12 Claims**

1. A process for the treatment of spent particulate alumina-base catalysts, comprising:

(a) treating the particles of catalyst with gaseous sulfur trioxide at a temperature of from 350° to 550° C. to cause a first reaction converting at least a substantial portion of the alumina present inthe catalyst to aluminum sulfate; and

(b) treating the particles produced in step (a) with an aqueous solution of the hydroxide of a cation having a soluble sulfate salt at a pH of 9 to 12 to cause a second reaction converting at least a substantial proportion of the aluminum sulfate to an aluminum hydroxide.

4,537,752

METHOD FOR REMOVING HYDROGEN SULFIDE FROM GAS STREAMS

Gunter Weber, Linden, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 455,703, Jan. 5, 1983, abandoned. This application Jul. 17, 1984, Ser. No. 631,706

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1982, 3239602

Int. Cl.³ B01D *53/34;* C01B *17/05*

U.S. Cl. 423—224 **16 Claims**

1. In a process for the simultaneous absorption and oxidation of hydrogen sulfide to sulfur, comprising the steps of scrubbing in a scrubbing stage a gas consisting essentially of a sour gas containing H_2S with an aqueous, alkaline scrubbing solution containing pentavalent vanadium as the oxidizing agent, wherein the hydrogen sulfide is absorbed by the scrubbing agent and oxidized by pentavalent vanadium to elemental sulfur with reduction of the pentavalent vanadium to tetravalent vanadium, and then in a regeneration stage, separate from the scrubbing stage, regenerating the thus-reduced scrubbing solution in the presence of a promoter by reoxidation of the tetravalent vanadium gas to pentavalent vanadium with a gas containing molecular oxygen, the improvement wherein the scrubbing solution consists essentially of sodium carbonate, vanadium, and an amine promoter.

4,537,753

REMOVAL OF CO_2 AND H_2S FROM NATURAL GASES

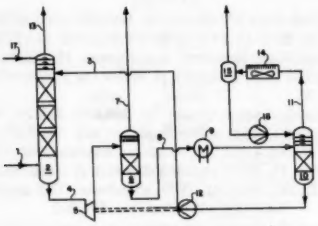
Eckhart Wagner, Ludwigshafen; Klaus Volkamer, Frankenthal, and Ulrich Wagner, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 30, 1983, Ser. No. 537,837

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1982, 3236600

Int. Cl.[3] B01D *53/34*

U.S. Cl. 423—228 5 Claims



1. A process for removing CO_2 and, where relevant, H_2S from a natural gas which contains CO_2 and may or may not contain H_2S, which comprises:

(a) treating said natural gas in an absorption stage at from 40° to 100° C. and at a pressure of from 10 to 110 bar with an aqueous absorption liquid containing from 20 to 70% by weight of methyldiethanolamine by feeding in the natural gas at the bottom and the aqueous absorption liquid at the top of the absorption stage, CO_2 and, where it is present, H_2S being washed out by a counter-current procedure;

(b) taking off the treated natural gas at the top of the absorption stage;

(c) taking off the aqueous absorption liquid laden with CO_2 and, where relevant, H_2S at the bottom of the absorption stage;

(d) regenerating the laden aqueous absorption liquid without the use of a stripping column by flashing the liquid in one or more flash stages, letting down the pressure in the last flash stage, or in the single flash stage where only one such stage is employed, to about 1 to 3 bar; and

(e) recycling the regenerated absorption liquid to the absorption stage.

4,537,754

ZEOLITE EU-1 AND A METHOD OF MAKING ZEOLITE EU-1

John L. Casci, Redcar; Barrie M. Lowe, Edinburgh, and Thomas V. Whittam, Darlington, all of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Jun. 11, 1981, Ser. No. 272,465

Claims priority, application United Kingdom, Jun. 12, 1980, 8019210

Int. Cl.[3] C01B *35/10, 33/28, 33/20*

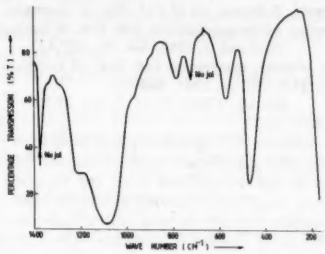
U.S. Cl. 423—277 13 Claims

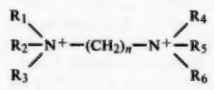
1. Zeolite EU-1 having a molar composition expressed by the formula:

$$0.5 \text{ to } 1.5\ R_2O{:}Y_2O_3{:}\text{at least } 10\ XO_2{:}0 \text{ to } 100\ H_2O$$

wherein R is a monovalent cation or $^1/_n$ of a cation of valency n, X is silicon and/or germanium, Y is one or more of aluminium, iron, gallium or boron, and H_2O is water of hydration additional to water notionally present when R is H, and having, when freshly prepared, an X-ray diffraction pattern as shown in Table 1.

5. A method of making zeolite EU-1 as defined in claim 1 which comprises reacting an aqueous mixture comprising at least one oxide XO_2, at least one oxide Y_2O_3 and at least one alkylated derivative of a polymethylene α-ω diamine having the formula:





, or a precursor thereof, wherein n is in the range from 3 to 12 and R_1 to R_6 which may be the same or different, can be alkyl or hydroxyalkyl groups containing from 1 to 8 carbon atoms and up to five of the groups R_1–R_6 can be hydrogen, the mixture having the molar composition:

XO_2/Y_2O_3	at least 10
OH^-/XO_2	0.1 to 6.0
$(M^+ + Q)/Y_2O_3$	0.5 to 100
$Q/(M^+ + Q)$	0.1 to 1.0
H_2O/XO_2	1 to 100

where X is silicon and/or germanium, Y is one or more of aluminium, iron, gallium, or boron, M is an alkali metal or ammonium, and Q is the aforesaid alkylated derivative of a polymethylene diamine, or a precursor thereof.

4,537,755

SELECTIVE OLIGOMER PRODUCTION

Hsueh M. Li, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Dec. 5, 1983, Ser. No. 558,314

Int. Cl.[3] C01B *25/10*

U.S. Cl. 423—300 3 Claims

1. A non-catalytic process for the preparation of halophosphazene oligomer enriched in cyclic trimer which consists essentially of:

(a) concurrently introducing halogen halide and ammonia into an agitated liquid dilvent in which halophosphazene oligomer is soluble, these materials being proportioned so as to form a reaction system composed of a dilute slurry of finely divided ammonium halide particles; and then

(b) concurrently introducing phosphorus trihalide and halogen into the slurried reaction system from (a) heated to a temperature of about 80° to about 180° C.;

the quantities of the reactants introduced into the reaction medium being proportioned such that:

(c) the ammonium halide:phosphorus trihalide molar ratio is between about 1:1 and about 3:1;

(d) the phosphorus trihalide:halogen molar ratio is kept above about 0.5:1 and below about 2:1 until all of the phosphorus trihalide has been introduced, and thereafter the halogen is introduced in an amount sufficient to give a total phosphorus trihalide : halogen molar ratio above about 0.5:1 but below about 1:1.

4,537,756
PROCESS FOR THE ELECTROTHERMAL PRODUCTION OF YELLOW PHOSPHORUS

Karl Röttgen, Erftstadt; Joachim Stendel, Brühl, and Herbert Diskowski, Erftstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 3, 1984, Ser. No. 627,427

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1983, 3325813; Feb. 11, 1984, 3404952

Int. Cl.³ C01B *25/01, 25/02, 25/04*

U.S. Cl. 423—323 **21 Claims**

1. A process for making yellow phosphorus from phosphate pellets, coke and gravel inside an electrothermal furnace while removing foreign components from the furnace's material cycle which comprises: removing molten ferrophosphorus, a molten calcium metasilicate slag and a dust-containing gas mixture consisting essentially of carbon monoxide and phosphorus in vapor form from the furnace; separating the dust electrostatically from said gas mixture; treating said dust with water with the resultant formation of a dust suspension; granulating crude phosphate and a mixture of dust suspension and binder on a granulating means; calcining the granulated material on a sintering means; and making it into phosphate pellets; grinding a portion of said slag; granulating the ground slag and at least a portion of dust suspension in a ratio by weight of 5:1 to 7:1 on a granulating means; drying and calcining the granulated material with the resultant formation of pellets containing the foreign components selected from the group consisting of zinc, cadmium and further heavy metals in the form of insoluble matter; and giving said pellets on to a deposition site.

4,537,757
CRYSTALLINE ALUMINOSILICATE AZ-1 AND A PROCESS FOR PRODUCING THE SAME

Masazumi Chono, and Hiroshi Ishida, both of Kurashiki, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 562,495, Dec. 16, 1983, abandoned. This application Mar. 30, 1984, Ser. No. 595,069

Claims priority, application Japan, Dec. 30, 1982, 57-228283; Apr. 30, 1983, 58-77265

Int. Cl.³ C01B *33/28*

U.S. Cl. 423—328 **11 Claims**

1. A crystalline aluminosilicate having a molar composition represented by the formula:

$$M_{2/n}O.Al_2O_3.YSiO_2$$

wherein M is at least one cation having a valence n and Y is at least 10, and having in its X-ray diffraction pattern obtained by using CuKα line at least seven diffraction lines showing the following relative intensities at the positions of the following respective diffraction angles (2θ):

Diffraction angle (2θ, deg)	Relative intensity
7.8 ± 0.2	5–30
8.7 ± 0.2	90–100
8.9 ± 0.2	90–100
17.5 ± 0.2	5–30
17.7 ± 0.2	5–30
23.1 ± 0.2	30–80
23.3 ± 0.2	20–50

taking the intensity of the diffraction line at a diffraction angle of 8.7°±0.2° or 8.9°±0.2° as 100.

4. A process for producing a crystalline aluminosilicate according to claim 1 which comprises preparing a mixture of a silica source, an alumina source, a sodium source, water and 1,8-diamino-4-aminomethyloctane and having the following molar composition:

SiO_2/Al_2O_3	10 to 1000
Na/SiO_2	0.05 to 1.0
H_2O/SiO_2	5 to 200
1,8-diamino-4-aminomethyloctane/SiO_2	0.1 to 10

and reacting the components of said mixture with one another at a temperature of 100° to 250° C.

4,537,758
PROCESS FOR PREPARING HIGHLY SILICEOUS POROUS ZSM-12 TYPE CRYSTALLINE MATERIAL

Pochen Chu, West Deptford, and Güenter H. Kühl, Cherry Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 288,603, Jul. 30, 1981, abandoned, and a continuation-in-part of Ser. No. 235,116, Feb. 17, 1981, Pat. No. 4,452,769, which is a continuation of Ser. No. 140,466, Apr. 17, 1980, abandoned, which is a continuation of Ser. No. 22,260, Mar. 21, 1979, abandoned. This application Mar. 19, 1984, Ser. No. 591,092

The portion of the term of this patent subsequent to Jun. 5, 2001, has been disclaimed.

Int. Cl.³ C01B *33/28*

U.S. Cl. 423—329 **2 Claims**

1. In a process for preparing a zeolite ZSM-12 type crystalline material by preparing a reaction mixture containing a source of an alkali or alkaline earth metal oxide, an oxide of silicon, methyltriethylammonium ion and water, and maintaining said mixture under crystallization conditions until crystals of said zeolite are formed, the improvement which comprises:

preparing the reaction mixture from a high purity silica source, said reaction mixture containing no added alumina, having a pre-crystallization pH of about 13, and having a composition, in terms of mole ratios of oxides, falling within the following ranges:

SiO_2/Al_2O_3	200 to ∞
$M_2O/[(MTEA)_2O + M_2O]$	0.0 to 0.8
OH^-/SiO_2	0.1 to 1.2
$H_2O/[(MTEA)_2O + M_2O]$	50 to 250

wherein M is an alkali or alkaline earth metal and $(MTEA)^+$ is a methyltriethylammonium ion.

4,537,759
PRODUCTION OF ELEMENTAL SILICON FROM IMPURE SILANE FEED

Joe M. Walker, Pittsburg, Kans., and Thomas M. Potts, Miami, Okla., assignors to Eagle-Picher Industries, Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 295,654, Aug. 24, 1981, abandoned. This application Jun. 27, 1983, Ser. No. 507,768

Int. Cl.³ C01B *33/02*

U.S. Cl. 423—349 **11 Claims**

1. In the production of elemental silicon by decomposition of silane,

the improvement comprising,

providing a gas chromatograph column having a packing selected from the group consisting of porous polymer and molecular sieve column packing materials and which differentially retards the flow through it of silane gas in comparison to the flow of undesirable impurities contained in said gas,

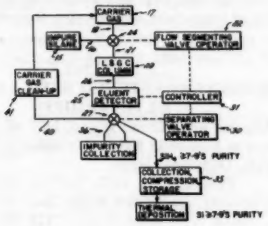
preconditioning said packing by heating the column and packing therein for a period of at least one hour at a temperature about 10°–30° C. below the maximum operating temperature of the packing, then flowing a stream of silane gas over the packing so heated for a period of at least about one-half

hour, the column so conditioned providing substantially better separation of silane from impurities than a corresponding column which is not so preconditioned,

providing a silane gas feed containing undesirable impurities of the electronically active type,

injecting said feed as a series of regularly spaced pulses into a stream of an inert carrier gas,

passing the resulting stream through said column, the packing therein differentially retarding the silane gas component of each respective pulse so that it elutes from the column as a silane peak at a different time than the said impurities,



operating a valve to direct the silane peak of each respective pulse to a separate outlet line from the impurities, said valve being opened only during elution of the silane peak, for so brief a period that the purity of the valved silane and admixed carrier gas is no less than that of electronic grade silicon, and

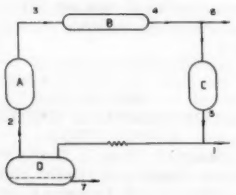
decomposing the thus separated silane, in the presence of the carrier gas, to produce elemental silicon of at least electronic grade purity.

4,537,760

PROCESS FOR THE MANUFACTURE OF AMMONIA

Ram Lavie, Haifa, Israel, assignor to Technion Research and Development Foundation, Inc., Haifa, Israel

Continuation-in-part of Ser. No. 403,137, Jul. 29, 1982, abandoned. This application Aug. 14, 1984, Ser. No. 640,858
Claims priority, application Israel, Aug. 21, 1981, 63630
Int. Cl.³ C01C *1/04*
U.S. Cl. 423—359 **15 Claims**



1. A process for the manufacture of ammonia, comprising the steps of

(a) feeding a gaseous mixture of hydrogen and nitrogen, or generators thereof in the proportions of about 3 moles hydrogen to 1 mole nitrogen, together with inert gases, into a converter containing catalyst(s) for ammonia synthesis and thereby producing ammonia;

(b) conveying the reaction mixture from said converter through an adsorbent to effect adsorption of the formed ammonia together with some inert gases, whereby the adsorbed gases are separated from the unreacted mixture of gases, the latter being recycled to the converter;

(c) effecting desorption of ammonia from the ammonia-loaded adsorbent by direct contact of said adsorbent with a concentrated hot stream of ammonia-containing gases comprising the hot effluent from the converter;

(d) condensing the ammonia eliberated from the adsorbent to liquid ammonia; and

wherein the adsorption and desorption steps are carried out in phased order, providing continuous streams of controlled compositions.

8. A process for the manufacture of ammonia, comprising the steps of

(a) feeding a gaseous mixture of hydrogen and nitrogen, or generators thereof in the proportions of about 3 moles hydrogen to 1 mole nitrogen, together with inert gases, into a converter containing catalyst(s) for ammonia synthesis and thereby producing ammonia;

(b) conveying the reaction mixture from said converter through an adsorbent to effect adsorption of the formed ammonia together with some inert gases, whereby the adsorbed gases are separated from the unreacted mixture of gases, the latter being recycled to the converter;

(c) effecting desorption of ammonia from the ammonia-loaded adsorbent by direct contact of said adsorbent with a concentrated hot stream of ammonia-containing gases comprising hot compressed ammonia refrigerant which is at least as concentrated with ammonia as the hot effluent from the converter;

(d) condensing the ammonia eliberated from the adsorbent to liquid ammonia; and

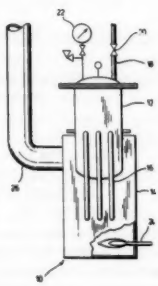
wherein the adsorption and desorption steps are carried out in phased order, providing continuous streams of controlled compositions.

4,537,761

HYDROGEN STORAGE SYSTEM

Gordon A. D. Reed, Don Mills, and Irwin J. Itzkovitch, Nepean, both of Canada, assignors to Liquid Carbonic Inc., Montreal, Canada

Continuation of Ser. No. 475,143, Mar. 14, 1983, abandoned. This application May 17, 1984, Ser. No. 611,343
Int. Cl.³ C01B *6/74*
U.S. Cl. 423—644 **14 Claims**



1. A method of preparing a metal for metal hydride formation consisting essentially of:

subjecting a particulate hydride-forming magnesium/copper alloy composition in which magnesium is the major component, to a plurality of sequential activating cycles to produce an activated particulate magnesium/copper alloy composition,

each activating cycle comprising a step of heating the magnesium/copper alloy composition in hydrogen at a temperature of 280° to 355° C. and a pressure of 500 to 650 psig to hydride the magnesium/copper alloy composition followed by an immediate step of dehydriding the hydrided composition.

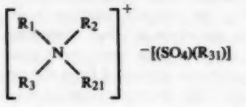
4,537,762

HAIR COMPOSITIONS CONTAINING MIXTURES OF QUATERNARY AMMONIUM COMPOUNDS AND TERTIARY AMINE SALTS OF LONG-CHAIN ACIDS

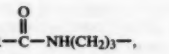
Arnold W. Fogel, Park Ridge, and Albert Zofchak, Matawan, both of N.J., assignors to Bernel Chemical Co., Waldwick and Alzo, Inc., Matawan, both of, N.J.

Filed Nov. 14, 1983, Ser. No. 551,484
Int. Cl.[3] A61K *7/06*
U.S. Cl. 424—70 **4 Claims**

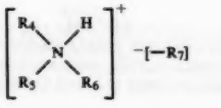
1. A hair treating composition seleereo from the group consisting of creme rinses and conditioners comprising component (a) a quaternary ammonium compound of the formula



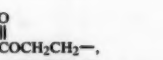
in which



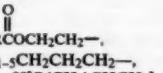
where R is an alkyl or alkenyl chain of 8 to 22 carbon atoms, R_2 and R_{21} are methyl or ethyl, and R_3 and R_{31} are alkyl chains of 1 to 3 carbons, and component (b) a tertiary amine salt of a long-chain acid of the formula



wherein R_4 is selected from the group consisting of saturated and unsaturated aliphatic groups containing from about 8 to about 22 carbon atoms,



$CH_3O[CH_2CH(CH_3)0]_{1-5}CH_2CH_2CH_2$—, H[O(CH$_3$)CHCH$_2$]$_{3-8}$, H[O(CH$_3$)CHCH$_2$]$_{3-8}OCH_2CH_2$—, $RCHOHCH_2$, and $ROCH_2CH_2CH_2$, wherein R represents a saturated or unsaturated aliphatic group containing from about 8 to about 22 carbon atoms; R_6 is selected from the group consisting of saturated and unsaturated groups containing from one to about two carbon atoms and $H(OCH_2CH_2)_{1-15}$, R_5 is selected from the group consisting of saturated and unsaturated aliphatic groups containing from about 1 to about 22 carbon atoms,



$CH_3O[CH_2CH(CH_3)O]_{1-5}CH_2CH_2CH_2$—, H[O(CH$_3$)CHCH$_2$]$_{3-8}$, H[O(CH$_3$)CHCH$_2$]$_{3-8}OCH_2CH_2$—, $RCHOHCH_2$, $ROCH_2CH_2CH_2$, saturated and unsaturated groups containing from one to about two carbon atoms and $H(OCH_2CH_2)_{1-15}$, and R_7 is selected from the group consisting of

$RCH{=}CH_2SO_3$—, RCONHCH(CH$_3$)CO$_2$—, $ROSO_3$, $RC_6H_5SO_3$—, RNHCOCH=CHCO$_2$, isostearic acid residue, ricinoleic and residue, and dimer acid residue, wherein R represents a saturated or unsaturated aliphatic group containing from about 8 to about 18 carbon atoms, the weight-to-weight ratio of the quaternary ammonium compound/tertiary amine salt of long-chain acid varying from 60/40 to 90/10.

4,537,763

PRODUCTS SWEETENED WITH α-GLYCOSYL GLYCYRRHIZIN

Toshio Miyake, and Hiromi Hijiya, both of Okayama, Japan, assignors to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo, Okayama, Japan

Filed Jun. 11, 1982, Ser. No. 387,651
Claims priority, application Japan, Jun. 20, 1981, 56-95714
Int. Cl.[3] A61K *7/16;* **A23L** *1/236;* **C12P** *19/18;* **C07H** *3/00*
U.S. Cl. 424—49 **13 Claims**

1. In an orally usable product containing a sweetening or flavoring amount of a sweetening or flavoring agent, the improvement wherein said sweetening or flavoring agent comprises α-glycosyl glycyrrhizin.

4,537,764

STABILIZED ENZYMATIC DENTIFRICE CONTAINING B-D-GLUCOSE AND GLUCOSE OXIDASE

Michael A. Pellico, and Robert E. Montgomery, both of Los Angeles, Calif., assignors to Laclede Professional Products, Inc., Gardena, Calif.

Continuation-in-part of Ser. No. 292,633, Aug. 13, 1981, abandoned. This application Jun. 6, 1983, Ser. No. 501,383
Int. Cl.[3] A61K *7/28, 37/48, 37/50*
U.S. Cl. 424—50 **10 Claims**

1. An enzymatic dentifrice comprising, per gram of dentifrice, from about 0.015 to about 0.6 millimoles of Beta-D-glucose and from about 0.5 to about 500 International Units of glucose oxidase for producing hydrogen peroxide upon oral application of said dentifrice, and limiting any water present in the dentifrice to an amount not more than about 10 wt. % based on the dentifrice weight to stabilize the dentifrice against the production of hydrogen peroxide prior to oral application of the dentifrice.

4,537,765

PEROXYDIPHOSPHATE TOOTHPASTE COMPOSITION

Abdul Gaffar, Somerset; Calvin B. Davis, North Brunswick; John J. Donohue, Neshanic, and Debbie Moy, Livingston, all of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 361,180, Mar. 24, 1982, abandoned. This application Jun. 21, 1983, Ser. No. 506,183
Int. Cl.[3] A61K *7/16, 7/20*
U.S. Cl. 424—53 **20 Claims**

1. A toothpaste composition having a pH of about 9.2 to about 10.5 consisting essentially of

I. an oral vehicle

II. as essentially the only oral chemically active agents,

A. 0 to about 2 wt.% of a fluorine-providing anticaries compound and

B. about 1 to about 7 wt. % of a peroxydiphosphate salt,

III. as essentially the only polishing material, about 10 to about 75 wt.% of at least one polishing material selected from the group consisting of silica and hydrated alumina,

IV. about 0.5 to about 10 wt.% of at least one thickener selected from the group consisting of colloidal silica, synthetic hectorite, poly(methyl vinyl ether/maleic anhydride), carboxyvinyl polymer, carboxymethyl cellulose, hydroxypropyl methyl cellulose, hydroxybutyl methyl cellulose, and hydroxyethyl cellulose, and

V. about 5 to about 75 wt.% of polyethylene glycol as essentially the only humectant.

4,537,766

LONG-WEARING EYESHADOW COMPOSITIONS

Julio G. Russ, Germantown, and Donna L. Barrom, Arlington, both of Tenn., assignors to Plough, Inc., Memphis, Tenn.

Continuation of Ser. No. 463,196, Feb. 2, 1983, abandoned, which is a continuation-in-part of Ser. No. 286,108, Jul. 22, 1981, abandoned. This application Mar. 12, 1984, Ser. No. 589,033

Int. Cl.³ A61K *7/021*

U.S. Cl. 424—63 **18 Claims**

1. An eyeshadow composition comprising by weight:

(a) 2 to 30 percent candelilla wax,

(b) 2 to 30 percent C_{18-36} acid triglyceride having a melting point between about 70° and 75° C. wherein the acid groups contain an average of about 28 carbon atoms,

(c) 2 to 30 percent wax other than (a) or (b) having a melting point between 55° and 100° C.;

wherein the total amount of (a), (b), and (c) is 10 to 50 percent by weight of the eyeshadow composition,

(d) 5 to 50 percent volatile, non-aqueous solvent for (a), (b), and (c),

(e) 5 to 50 percent cosmetically acceptable oil, and

(f) 5 to 50 percent of at least one pigment.

4,537,767

METHOD FOR CLEANSING FLUID DISCHARGING SKIN SURFACES, WOUNDS AND MUCOUS MEMBRANES AND MEANS FOR CARRYING OUT THE METHOD

Ulf S. E. Rothman, Bjärred, and Sten A. L. Jacobsson, Malmö, both of Sweden, assignors to Pharmacia Aktiebolag, Uppsala, Sweden

Continuation of Ser. No. 144,559, Apr. 28, 1980, abandoned, which is a continuation of Ser. No. 619,148, Oct. 2, 1975, Pat. No. 4,225,580, which is a continuation of Ser. No. 437,558, Jan. 29, 1974, abandoned. This application Sep. 24, 1982, Ser. No. 422,660

The portion of the term of this patent subsequent to Sep. 30, 1997, has been disclaimed.

Int. Cl.³ A61K *31/74, 31/70*

U.S. Cl. 424—78 **24 Claims**

1. A method for cleansing a fluid-discharging infected sore located on the exterior of the body, which method comprises applying thereto a particulate mass of dry water-insoluble polymer particles within the size range of 30 to 400μ, mixed with a dermatologically acceptable binder, said polymer particles being selected from water-soluble dextran, starch, and derivatives thereof cross-linked in aqueous solution to form a water-insoluble three-dimensional network held together by bonds of covalent nature, one gram of which swells in the presence of water to absorb approximately 1.5 to 10 grams of water, the swellability of the polymer particles in water being such that the polymeric particles in swollen state have a pore size which permits the penetration theretinto of low molecular weight materials discharging from the sore but which completely or substantially excludes penetration thereinto of materials discharging from the sore that have a molecular weight greater than about 50,000, which excluded materials migrate between the particles towards the outer boundaries of the particulate mass, thereby avoiding formation of a scab directly on the surface of the infected sore, maintaining said particulate mass in contact with said sore for a sufficient length of time to make the particles swollen and thereafter removing the resulting swollen particulate mass from contact with said sore.

4,537,768

COMBINED VACCINE

Peter Apontoweil, EK Leersum, and Johannes A. G. Kok, AB Soest, both of Netherlands, assignors to Roussel Uclaf, Paris, France

Continuation of Ser. No. 73,431, Sep. 7, 1979, abandoned. This application Mar. 11, 1982, Ser. No. 356,952

Claims priority, application Netherlands, Sep. 14, 1978, 7809364; Apr. 26, 1979, 7903300

Int. Cl.³ A61K *39/17, 39/235*

U.S. Cl. 424—89 **14 Claims**

1. In a combined inactivated vaccine ready for administration and active against Newcastle disease and egg production drop comprising a mixture of an aqueous phase containing an inactivated adeno-like virus (ALV) and an inactivated Newcastle disease virus (NDV) and an oily phase containing at least one emulsifier, the improvement, resulting in a smaller volume for administration, thus causing less irritation, comprising the aqueous phase comprising an adeno-like virus (ALV) containing aqueous liquid obtained by cultivating an in duck egg passaged virus strain 127 with a titre of at least 4×10^2 units/ml and an aqueous liquid of an inactivated Newcastle disease virus (NDV) with a titre of at least $10^{9.8}$ EID_{50}/ml, the volume ratio of NDV-liquid and ALV liquid being 3:4 to 5:1 and the volume ratio between the aqueous phase containing both virus liquids and the oily phase being 7:13 to 3:7.

4,537,769

STABILIZATION OF INFLUENZA VIRUS VACCINE

Costantino P. Cerini, Pearl River, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Filed Apr. 6, 1982, Ser. No. 366,296

Int. Cl.³ A61K *39/145*

U.S. Cl. 424—89 **21 Claims**

1. In a method for stabilizing the immunogenicity of neuraminidase and neuraminidase containing antiviral influenza vaccines neuromidase-stabilizing formulating the vaccine with an effective amount within the range of about 0.0% to about 4.0% w/v of an agent selected from the group consisting of protein hydrolysates, amino acids and combinations thereof.

4,537,770

A41030 ANTIBIOTICS

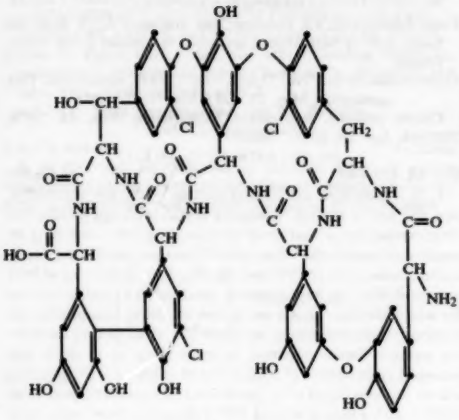
Karl H. Michel, and Ralph E. Kastner, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 443,496, Nov. 22, 1982, abandoned, which is a continuation-in-part of Ser. No. 361,301, Mar. 24, 1982, abandoned. This application Oct. 18, 1984, Ser. No. 662,464

Int. Cl.³ A61K *35/00;* **C07C** *103/52;* **C07G** *7/00*

U.S. Cl. 424—118 **7 Claims**

1. A41030 factor A, which has the structure



and the pharmaceutically-acceptable, non-toxic salts thereof.

4,537,771

ANTACIDS CONTAINING ZEOLITIC MOLECULAR SIEVES

Wolfgang Greb; Peter Christophliemk, and Christine Schröder, all of Duesseldorf, Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Jul. 15, 1983, Ser. No. 514,140

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1982, 3228485

Int. Cl.³ A61K *33/06*

U.S. Cl. 424—154 **23 Claims**

1. An antacid composition comprising

(a) an antacid effective quantity of at least one zeolitic alkali metal aluminosilicate, having a calcium binding power (Ca BP) of at least about 100 mg of CaO/g of aluminosilicates, of the A, X, Y, or P type molecular sieve, wherein the alkali metal is sodium or potassium or both sodium and potassium; and

(b) antacid adjuvant materials.

4,537,772

ENHANCING ABSORPTION OF DRUGS FROM GASTROINTESTINAL TRACT USING ACYLCARNITINES

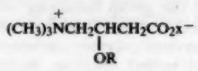
Jose Alexander, and Joseph A. Fix, both of Lawrence, Kans., assignors to Merck & Co., Inc., Rahway, N.J.

Filed May 2, 1984, Ser. No. 606,054

Int. Cl.³ A61K *31/52, 31/54, 31/70, 31/195, 31/205, 31/505, 37/00*

U.S. Cl. 514—9 **16 Claims**

1. A method of enhancing the rate of gastrointestinal absorption of an orally or rectally administered poorly absorbed drug selected from the group consisting of β-lactam antibiotics, aminoglycoside antibiotics, antiviral agents, amino acids, smooth muscle relaxants and polypeptides, said method comprising the steps of preparing a dosage form capable of being orally or rectally absorbed, said dosage form comprising a therapeutically effective dosage amount of said drug and an absorption enhancing effective amount of an acylcarnitine agent of the formula:



wherein R is saturated acyl(C_2–C_{20}), acyl(C_2–C_{20}) with 1 to 6 double bonds, hydroxyacyl(C_2–C_{20}) with 1 to 3 hydroxy groups, ketoacyl(C_4–C_{20}), unsaturated hydroxyacyl(C_5–C_{20}) or carbalkoxyacyl(C_5–C_{20}) and X is a pharmaceutically acceptable counterion.

4,537,773

α-AMINOBORONIC ACID DERIVATIVES

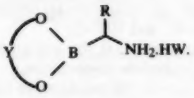
Ashokkumar B. Shenvi, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 5, 1983, Ser. No. 558,361

Int. Cl.³ C07F *5/02, 5/04, 7/08, 7/02*

U.S. Cl. 514—63 **22 Claims**

1. A compound of the formula



wherein

R is alkyl or $—CH_2R^1$;

R^1 is $—XR^2$, aryl, or aryl substituted with one or more alkyl groups;

R^2 is —H, alkyl, or $—SiR^3R^4R^5$;

R^3, R^4 and R^5 are independently alkyl, aryl or aryl substituted with one or more alkoxy groups;

X is O or S;

Y is a moiety derived from a dihydroxy compound comprising at least two hydroxy groups separated by at least two connecting atoms in a chain or ring, said chain or ring comprising carbon atoms and, optionally, a heteroatom which can be N, S, or O; and

HW is a mineral acid, sulfonic acid, alkanoic acid or a perfluoroalkanoic acid.

4,537,774

HOT-WATER EXTRACTS OF NEEM BARK

Masaki Shimizu, Tokyo; Tadashi Sudo, Honmachi, and Takeo Nomura, Hino, all of Japan, assignors to Terumo Corporation, Tokyo, Japan

Continuation of Ser. No. 290,876, Aug. 7, 1981, abandoned. This application Oct. 13, 1983, Ser. No. 541,479

Claims priority, application Japan, Aug. 19, 1980, 55-113786; Sep. 8, 1980, 55-124353; Apr. 24, 1981, 56-61482; Apr. 24, 1981, 56-61483

Int. Cl.³ A61K *35/78*

U.S. Cl. 424—195.1 **16 Claims**

1. Hot-water extract of neem bark which is characterized by being active against mouse L-5178Y cells and against transplanted sarcoma 180 tumors produced by successively contacting the bark of neem which is *Melia azadirachta* with a polar organic solvent selected from the group consisting of an alcohol, pyridine and acetone, and water at a temperature from 0° C. to 40° C. to form liquid extracts and a residue, subjecting said residue from said treatments to extraction with hot water at the boiling temperature to obtain hot-water liquid extract and purifying said hot water liquid extract by alcohol precipitation or dialysis using a diaphragm which fractionates molecules having a molecular weight of 50,000 or lower.

4,537,775

THERAPEUTIC TREATMENT FOR VIRAL INFECTIONS

James B. Mercer, 13109 W. 95th St., Lenexa, Kans. 66215

Continuation-in-part of Ser. No. 64,072, Aug. 6, 1979, Pat. No. 4,346,095. This application Aug. 13, 1982, Ser. No. 407,808

Int. Cl.³ A61K *31/415*

U.S. Cl. 514—398 10 Claims

1. A method for treating a human host having viral thyroiditis, said method comprising:

(a) repeatedly orally administering anti-viral thyroiditis infection effective amounts of a pharmaceutical composition which contains, as an active ingredient, 1-(β-hydroxyethyl)-2-methyl-5-nitroimidazole, to a human host in need of said treatment.

4,537,776

PENETRATING TOPICAL PHARMACEUTICAL COMPOSITIONS CONTAINING N-(2-HYDROXYETHYL) PYRROLIDONE

Eugene R. Cooper, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 21, 1983, Ser. No. 506,273

Int. Cl.³ A01N *43/36*; A61K *31/40*

U.S. Cl. 514—424 22 Claims

1. A penetration-enhancing pharmaceutical composition for topical application, comprising:

(a) a safe and effective amount of a non-steroidal anti-inflammatory agent selected from the group consisting of salicylic acid, acetyl salicylic acid, methyl salicylate, glycol salicylate, salicylmides, benzyl-2,5-diacetoxybenzoic acid, ibuprofen, fulindac, naproxen, ketoprofen, etofenamate, phenylbutazone, indomethacin, piroxicam, and mixtures thereof;

(b) 0% to about 80% by weight of a solvent selected from ethanol or 2-propanol;

(c) 0% to about 80% by weight water; and

(d) about 10% to about 99.9% by weight of a penetration-enhancing vehicle consisting essentially of

(i) N-(2-hydroxyethyl)pyrrolidone, and

(ii) a cell-envelope disordering compound selected from the group consisting of methyl laurate, oleic acid, oleyl alcohol, monoolein, myristyl alcohol, and mixtures thereof;

wherein component (d)(i) and (d)(ii) are present in a ratio of (d)(i):(d)(ii) of about 1:5 to about 500:1 by weight.

4,537,777

A52688 ANTIBIOTICS AND PROCESS FOR THEIR PRODUCTION

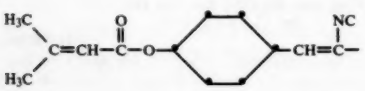
Marie T. Anderson; Karl H. Michel, both of Indianapolis, and Thomas H. Sands, Brownsburg, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

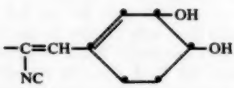
Filed Dec. 16, 1983, Ser. No. 562,256

Int. Cl.³ A01N *37/34*; C07C *119/02*; C12P *13/00*

U.S. Cl. 514—521 40 Claims

1. A52688 factor A which has the formula





(trans)

and the C_2–C_{18}-acyl ester derivatives of A52688 factor A.

23. An antineoplastic composition which comprises an effective amount of a compound of claim 1 and a suitable vehicle.

4,537,778

ORAL PREPARATION

Donald Clipper, Belle Mead, and James Norfleet, Plainfield, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 455,388, Jan. 3, 1983, Pat. No. 4,431,631. This application Feb. 13, 1984, Ser. No. 579,835

The portion of the term of this patent subsequent to Feb. 14, 2001, has been disclaimed.

Int. Cl.³ A61K *7/16*, *7/20*

U.S. Cl. 424—53 13 Claims

1. An aqueous oral composition comprising:

(a) from about 0.5 to about 5% by weight of hydrogen peroxide, and

(b) a flavoring agent selected from the group consisting of:

(1) wintergreen flavor containing methyl salicylate and menthol in a weight ratio of about 3:1 to 5:1, and

(2) cinnamon flavor containing 6–9% menthol, 32–38% cinnamic aldehyde and 6–9% clove oil

---

4,537,779

PHARMACOLOGICALLY ACTIVE COMPOUNDS

Graham J. Durant, Welwyn Garden City; John C. Emmett, Codicote, and Charon R. Ganellin, Welwyn Garden City, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

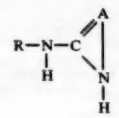
Division of Ser. No. 485,535, Apr. 15, 1983, Pat. No. 4,470,985, which is a division of Ser. No. 364,134, Mar. 31, 1982, Pat. No. 4,399,142, which is a division of Ser. No. 239,238, Mar. 3, 1981, Pat. No. 4,341,787, which is a division of Ser. No. 60,324, Jul. 25, 1979, Pat. No. 4,282,221, which is a division of Ser. No. 893,859, Apr. 6, 1978, Pat. No. 4,181,730, which is a division of Ser. No. 736,662, Oct. 29, 1976, Pat. No. 4,104,381, which is a division of Ser. No. 619,985, Oct. 6, 1975, Pat. No. 4,005,205, which is a division of Ser. No. 463,647, Apr. 24, 1974, Pat. No. 3,932,644. This application Jun. 18, 1984, Ser. No. 621,778

Claims priority, application United Kingdom, May 3, 1973, 21063/73; Jul. 26, 1983, 35551/73

Int. Cl.³ A61K *31/44*

U.S. Cl. 514—275 5 Claims

1. A method of inhibiting H-2 histamine receptors, said H-2 histamine receptors being those histamine receptors which are not inhibited by mepyramine but are inhibited by burimamide, which comprises administering to an animal in need of inhibition of said receptors in an effective amount to inhibit said receptors a heterocyclic compound of the formula:



wherein A taken together with the nitrogen and carbon atoms show forms a pyridine ring, said ring having a keto or thione group and optionally substituted by one or two lower alkyl, phenyl or benzyl groups; R is a grouping of the formula:

$$Het—CH_2Z(CH_2)_n—$$

wherein Het is a nitrogen containing heterocyclic ring selected from pyridine, thiazole, isothiazole or thiadiazole, said ring being optionally substituted by lower alkyl, amino, hydroxy or halogen; Z is sulphur or a methylene group and n is 2 or 3 or a pharmaceutically acceptable acid addition salt thereof.

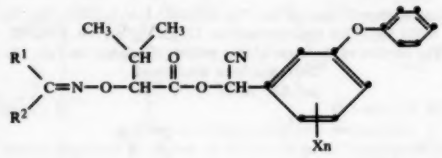
4,537,780

ALPHA-AMINOOXY ISOVALERATE INSECTICIDES

James R. Sanborn, and Charles H. Tieman, both of Modesto, Calif., assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 18, 1984, Ser. No. 662,116
Int. Cl.[3] A01N *43/16, 37/34;* C07C *121/75;* C07D *317/60*
U.S. Cl. 514—464 13 Claims

1. A compound of the formula



wherein X is a halogen atom; n is 0 or 1; R^1 is a hydrogen atom or an alkyl group containing from 1 to 6 carbon atoms; and R^2 is an alkyl or an alkenyl group containing up to 6 carbon atoms or a phenyl group optionally substituted by one or more substituents selected from a halogen atom or, an alkyl group containing from 1 to 4 carbon atoms optionally substituted by one or more halogen atoms or by a methylenedioxy group.

13. A method of controlling insect pests at a locus which comprises applying to the insects or to the locus an insecticidally effective amount of a compound according to claim 1.

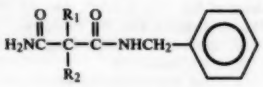
4,537,781

PHARMACEUTICALLY USEFUL MALONAMIDES

Charles M. Darling, Auburn, Ala., assignor to Research Corporation, New York, N.Y.

Filed Sep. 16, 1983, Ser. No. 533,261
Int. Cl.[3] C07C *103/147*
U.S. Cl. 514—616 27 Claims

1. A compound of the formula



wherein R_1 and R_2 are the same or different and are hydrogen or alkyl with the proviso that R_1 and R_2 are not both hydrogen.

4,537,782

EMULSIFYING SYSTEM BASED ON A FATTY ACID OR A PROTEIN CONDENSATE, A POLYOXYETHYLENATED STEROL AND A PHOSPHATIDE, AND A COSMETIC OR PHARMACEUTICAL COMPOSITION CONTAINING THE SAME

Catherine Millet, Paris; Jean-Claude Ser, Chevilly Larue, and Quang L. N'Guyen, Antony, all of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Filed Jan. 20, 1983, Ser. No. 459,496
Claims priority, application France, Jan. 28, 1982, 82 01329
Int. Cl.[3] A61K *7/021, 7/42, 31/685, 47/00*
U.S. Cl. 514—774 15 Claims

1. A emulsifying system to produce an emulsoid or gel comprising

(i) 5 to 60 weight percent of at least one fatty acid having 8–22 carbon atoms or a protein condensate of a fatty acid having 8–40 carbon atoms and a polypeptide of animal origin,

(ii) 5 to 45 weight percent of sterol polyoxyethylenated with 12–40 moles of ethylene oxide, and

(iii) 15 to 90 weight percent of a phosphatide.

4,537,783

CONTROL OF PARTICLE SIZE DISTRIBUTION DURING CONTINUOUS HEAT-SETTING OF MEAT ANALOG

Alexander L. Liepa, Montgomery, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Apr. 20, 1983, Ser. No. 486,612
Int. Cl.[3] A23J *3/00*
U.S. Cl. 426—243 13 Claims

1. In a process for continuously forming and heat-setting moist agglomerated textured protein in the form of a particulate meat analog, the improvement comprising forming a continuous layer on a moving feeder surface as a wet slurry an agglomerate having a bulk density of about 0.45 g/cc to about 0.80 g/cc, said layer having a thickness of 0.3 cm to 3.5 cm, and then transferring the agglomerate layer by dropping said agglomerate onto a conveyor such that discrete particulates are formed and wherein said conveyor is traveling through a heat-setting zone, the ratio of the heat-setting conveyor surface speed to the feeder surface speed being from about 1.1:1 to about 5:1.

4,537,784

PROCESS OF PREPARING A PARTICULATE FOOD ACIDULANT

Phillip J. Percel, Parma, and Douglas W. Perkins, Medina, both, Ohio, assignors to SCM Corporation, New York, N.Y.

Division of Ser. No. 499,353, May 31, 1983, Pat. No. 4,511,584.
This application Feb. 7, 1985, Ser. No. 699,384
Int. Cl.[3] A23L *1/221*
U.S. Cl. 426—303 3 Claims

1. A process for making a particulate food acidulant comprising calcium lactate carrier, lactic acid, and lipid coating comprising the steps of:

plating lactic acid onto particulate calcium lactate carrier by spray applying said lactic acid onto said calcium lactate carrier, while said carrier is in the form of a fluid bed, from a lactic acid solution of more than 80% concentration; the calcium lactate plated with lactic acid containing less than about 13% by weight water following spray application; and said calcium lactate plated with lactic acid having a particle size distribution such that at least 80% is retained on U.S. Standard Sieve screens in the range of 20–70 mesh, inclusive; and then

encapsulating said carrier and acid by spray coating said carrier and acid with a molten edible lipid in an amount effective to prevent substantial release of acid from said acidulant before said lipid coating melts, while said carrier and acid are in the form of a fluid bed, said lipid containing less than about 0.5% by weight water;

said coating taking place before material absorption of water by the lactic acid.

4,537,785

PROCESS FOR PRODUCING PRESERVED FISH FOOD AND FISH FOOD PRODUCED

Ralph A. Nichols, 21 Elm Way, Kerrville, Tex. 78028

Filed Apr. 25, 1983, Ser. No. 488,582
Int. Cl.[3] A23L *3/34*
U.S. Cl. 426—332 11 Claims

1. A process for producing a preserved fish food from live fish food material naturally sized for feeding to aquarium fish comprising providing a quantity of live fish food, draining any excess water from the live fish food, mixing the drained live fish food with 17–50% by weight of the fish food of substantially anhydrous liquid propylene glycol for dehydrating the live fish food, allowing the mixture to stand for a sufficient period of time to reach a substantially equilibrium concentration of water in said liquid, draining said liquid from the fish food, and adding approximately 10–20by weight based upon the weight of the fish food of anhydrous propylene glycol.

4,537,786

METHOD OF PREPARING LOW OIL FRIED POTATO CHIPS

Donald C. Bernard, Lewisville, Tex., assignor to Frito-Lay, Inc., Dallas, Tex.

Filed Dec. 5, 1983, Ser. No. 558,360
Int. Cl.[3] A23L *1/216*
U.S. Cl. 426—438 10 Claims

1. A process for producing low oil content fried potato chips comprising; frying potato slices in edible oil at a temperature of from about 280° F. to about 320° F., removing said potato slices from said edible oil when said potato slices have a moisture content of from about 3% to about 15% by weight, orienting said potato slices on-edge and contacting the fried potato slices for from about 1 to about 10 minutes with an oil-removing forced stream of air within about 10 seconds after said potato slices are fried and while said potato slices are oriented on-edge, said air being preheated to a temperature of from about 250° F. to about 350° F.

4,537,787

METHOD OF PREPARING A PRESSED CHEESE CURD HAVING A CLOSED RIND

Ype Y. van der Velde, Wommels, and Jan Zantinge, Drachten, both of Netherlands, assignors to Tebel Machinefabrieken B.V., Netherlands

Continuation of Ser. No. 306,898, Sep. 29, 1981, abandoned. This application Sep. 16, 1983, Ser. No. 532,690
Claims priority, application Netherlands, Oct. 6, 1980, 8005516
Int. Cl.[3] A23C *19/02*
U.S. Cl. 426—478 2 Claims

1. In a method of making a pressed curd having a closed rind which includes introducing curd into a cheese mold and subjecting said curd to a pressing cycle having a plurality of pressing operations thereby separating whey from curd, the improvement comprising subjecting said curd to stages of increased pressure wherein at least one of said stages has pressure periods of substantially equal duration and equal pressure throughout said pressure periods alternated with pressureless periods of substantially equal duration throughout said pressureless periods and wherein the pressure exerted during each successive stage of said pressing cycle is increased.

4,537,788

EGG JERKY PRODUCT AND METHOD OF PREPARATION

Valerie A. Proctor, Manhattan, and Franklin E. Cunningham, Leonardville, both of Kans., assignors to Kansas State University Research Foundation, Manhattan, Kans.

Filed Feb. 13, 1984, Ser. No. 579,580
Int. Cl.[3] A23L *1/32*
U.S. Cl. 426—614 7 Claims

1. A method of producing a meatless jerky-type product from whole eggs, comprising:

(a) preparing a blended fluid mixture comprising at least about 35% by weight of uncooked hydrated whole eggs, said mixture also containing flavoring ingredients;

(b) spreading said mixture in the form of flat sheets having an average thickness of from about 1 to 10 millimeters;

(c) heating said sheets at non-burning temperatures sufficient to coagulate the egg protein and integrate said mixture;

(d) drying the integrated mixture to a moisture content of from about 18 to 24% by weight, said mixture on completion of the drying having a water activity below 0.8 and being further characterized by a flexible, deformable, chewy condition; and

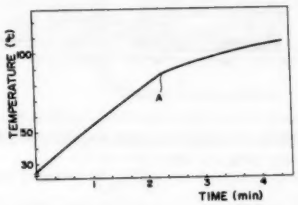
(e) before, during or after step (d), slicing said sheets into elongated strips to produce a jerky-type product.

4,537,789

PROCESS FOR PREPARING RETORT TOFU

Ko Sugisawa; Yasushi Matsumura; Kazumitsu Taga; Kouji Sengoku, and Yoshiaki Nagatome, all of Higashiosaka, Japan, assignors to House Food Industrial Company Ltd, Osaka, Japan

Filed Nov. 23, 1983, Ser. No. 554,863
Claims priority, application Japan, Oct. 20, 1983, 58-196806
Int. Cl.[3] A23J *3/00;* A23L *1/20*
U.S. Cl. 426—634 9 Claims



1. In a process for preparing retort tofu comprising the steps of charging a mixture of soybean milk or an aqueous solution of separated soybean protein and a coagulant into a heat-resistant container, sealing the container and then subjecting the container to heat treatment under pressure in a retort apparatus, the improvement which comprises:

(a) adjusting the rate of rise in temperature at the center of the mixture to within the range of about 0.05° to about 1.0° C./sec. by controlling a flow rate of steam or hot water to the retort apparatus from the beginning of the treatment to the inflection point A of a time-temperature graph having time as the abscissa and temperature as the ordinate of the graph, and

(b) controlling the pressure in the retort apparatus at the latest at the inflection point A by introducing air into the retort apparatus in order to make the pressure in the retort apparatus higher than that in the container.

4,537,790

PROCESS FOR GROWING CELL CULTURES OF DIPLOID CELLS ON CELL SUPPORTS

Florian Horodniceanu, Meudon, and Raphaël Le Fur, Louviers, both of France, assignors to Institut Pasteur, Paris, France

Division of Ser. No. 93,050, Nov. 13, 1979, Pat. No. 4,504,547, which is a continuation of Ser. No. 930,226, Aug. 2, 1978, abandoned. This application May 11, 1983, Ser. No. 493,715
Claims priority, application France, Aug. 8, 1977, 77 24421
The portion of the term of this patent subsequent to Mar. 12, 2002, has been disclaimed.
Int. Cl.[3] A01N *1/02;* C12N *11/08*
U.S. Cl. 427—2 10 Claims

10. In a process for growing human or animal diploid cells in a culture medium,

the improvement which comprises growing said cells in contact with cell support prepared by applying to glass or polysaccharide base support a solution of a thermosetting plastic material comprising the reaction product of an aldehyde with a polyvinyl alcohol and then subjecting said support thus-coated to the effect of heat under sufficient conditions to permit hardening of said thermosetting plastic material and the sterilization of the thus-coated support.

4,537,791

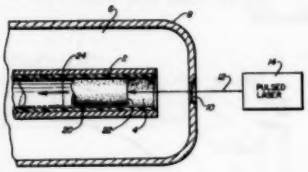
CARBON COATING OF GRAFTS OR CATHETERS

Peter P. Tarjan, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Mar. 27, 1984, Ser. No. 594,037

Int. Cl.³ A01N *1/02*; B05D *3/06*

U.S. Cl. 427—2 **15 Claims**



1. A method of coating an internal surface of a tube having a lumen comprising the steps of

positioning a carbon body within the lumen of the tube to be coated;

applying a beam of energy to said carbon body and causing the creation of gaseous carbon atoms to be deposited on the internal surface forming said lumen; and

causing relative movement between the internal surface and the carbon body during application of said beam.

4,537,792

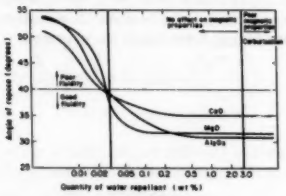
METHOD OF APPLYING AN ANNEALING SEPARATOR TO GRAIN ORIENTED MAGNETIC STEEL SHEETS

Minoru Kitayama; Motoharu Nakamura; Kikuji Hirose, and Masashi Tanida, all of Himejishi, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Sep. 30, 1983, Ser. No. 537,665

Int. Cl.³ B05D *1/04*; C23F *7/00*

U.S. Cl. 427—13 **1 Claim**



1. In a method of applying an annealing separator electrostatically to a glass-like film-forming undercoating consisting mainly of a magnesium oxide on the surface of a grain oriented magnetic steel sheet, thus overcoating said undercoating, the improvement wherein said annealing separator contains an organic silicon compound in a quantity of 0.3 to 3.00% by weight.

4,537,793

METHOD FOR GENERATING HARD, WEAR-PROOF SURFACE LAYERS ON A METALLIC MATERIAL

Hans-Peter Kehrer, Pforzheim; Jüergen Villain, Unterhaching, and Werner Reiff, Baldham, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 6, 1983, Ser. No. 501,287

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1982, 3224810

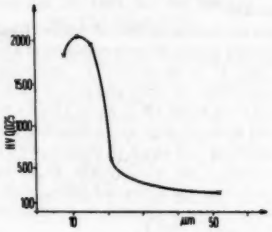
Int. Cl.³ C23C *3/04*

U.S. Cl. 427—35 **7 Claims**

1. A method for producing hard, wear-proof surface layers on a metallic material, comprising:

applying a decomposable compound containing an element capable of hardening metallic material onto a metallic material surface to be hardened; and

applying an energy surge to at least the surface areas containing said compound so as to decompose said compound and release said element which diffuses into the surface to be hardened, thereby producing a surface layer having a chemical composition different from that of said metallic material;



said applyings being carried out so that said surface layer has a thickness up to about 20 µm.

4,537,794

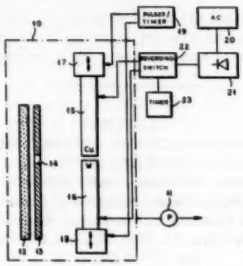
METHOD OF COATING CERAMICS

Eduard Pinkhasov, Mt. Vernon, N.Y., assignor to Wedtech Corp., Bronx, N.Y.

Continuation-in-part of Ser. No. 614,434, May 25, 1984, Pat. No. 4,505,948, which is a continuation-in-part of Ser. No. 494,302, May 13, 1983, , which is a continuation-in-part of Ser. No. 358,186, Mar. 15, 1982, Pat. No. 4,438,153, which is a continuation-in-part of Ser. No. 237,670, Feb. 24, 1981, Pat. No. 4,351,855. This application Jun. 29, 1984, Ser. No. 626,056

Int. Cl.³ B05B *1/24*; C23C *13/00*

U.S. Cl. 427—37 **12 Claims**



1. A method of bonding a high conductivity metal to a ceramic which comprises the steps of:

applying to a ceramic substrate a thin bonding layer of a refractory metal; and

thereafter applying said high conductivity metal to said layer, each of said metals being applied by striking an arc between a pair of electrodes to vaporize the respective metal from one of said electrodes in an evacuated chamber, an electrode of said refractory metal being juxtaposed with an electrode of said high-conductivity metal, said electrodes being brought into contact and drawn apart to strike said arc, and said electrodes being initially energized with positive and negative polarities in one sense to initially deposit said refractory metal on said substrate and the polarity being thereafter reversed to deposit said high-conductivity metal upon said substrate.

4,537,795

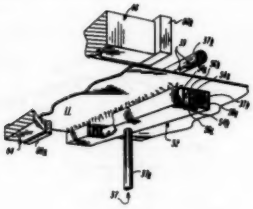
METHOD FOR INTRODUCING SWEEP GASES INTO A GLOW DISCHARGE DEPOSITION APPARATUS

Prem Nath, Rochester; Kevin R. Hoffman, Sterling Heights, and Timothy D. Laarman, Almont, all of Mich., assignors to Sovonics Solar Systems, Solon, Ohio

Continuation of Ser. No. 418,929, Sep. 16, 1982, abandoned. This application Aug. 3, 1984, Ser. No. 637,358

Int. Cl.[3] H01L *21/365*

U.S. Cl. 427—39 1 Claim



1. An improved method for the glow discharge deposition of semiconductor material utilizing apparatus adapted to operate at sub-atmospheric pressure, said apparatus including at least two adjacent deposition chambers operatively interconnected by a gas gate passageway, each of the chambers including (1) a plasma region wherein semiconductor precursor process gases are introduced for disassociation into an ionized plasma and deposition as layers of semiconductor material onto a substrate, the process gases introduced into the first chamber differing from the process gases introduced into the second chamber by the addition of at least one element; and (2) means for withdrawing the unused process gases and non-deposited plasma from adjacent the respective plasma region of each chamber; the improved method including the steps of:

providing an introducing means, operatively disposed adjacent the gas gate passageway in the second one of said chambers, for directing a flow of said sweep gases across both the layered and unlayered surfaces of the substrate as the substrate passes through the gas gate passageway from the first toward the second chamber;

assuring that the flow of sweep gases across both the layered and unlayered surfaces of the substrate is of a sufficient velocity to substantially prevent back diffusion of said at least one element from the first to the second chamber;

providing means for effecting the substantially laminar flow of sweep gases traveling through the gas gate passageway; and,

introducing a sufficient volumetric flow of sweep gases such that a portion of said introduced flow is directed so as to substantially prevent unused process gases and nondeposited plasma from leaving the plasma region of the second of the chambers.

4,537,796

METHOD FOR TREATING THE SURFACE OF A CONCRETE SLAB

Romain J. B. Buys, Mandekenstraat, 141B, 9360 Buggenhout, and Jean-Aimé Manouvrier, Avenue de la Rochefoucauld, 37, 1330 Rixensart, both of Belgium

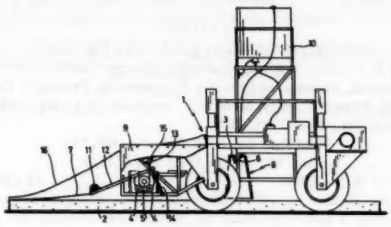
Filed Feb. 7, 1983, Ser. No. 464,169

Claims priority, application Belgium, Feb. 8, 1982, 207255

Int. Cl.[3] B05D *3/12, 5/02*

U.S. Cl. 427—136 7 Claims

1. A method of chemically stripping a concrete slab, comprising the steps of: distributing an agent for retarding the setting of an upper layer of mortar on the surface of a freshly laid concrete slab by spraying said agent from a row of nozzles, simultaneously spreading a water-impermeable sheet of plastics material over said upper layer immediately upstream of said spraying nozzles, and, as soon as the concrete in a layer subjacent to said upper layer has set, removing said sheet, then removing said upper layer of mortar whose setting has been



retarded from between surface aggregates in the concrete by simultaneously brushing and spraying with pressurized water.

4,537,797

PROCESS FOR THE PRODUCTION OF RECORD MATERIAL

Kenneth J. Shanton, Beaconsfield, England, assignor to The Wiggins Teape Group Limited, England

Division of Ser. No. 442,566, Nov. 18, 1982, Pat. No. 4,462,616. This application May 10, 1984, Ser. No. 608,856

Claims priority, application United Kingdom, Dec. 4, 1981, 8136583

Int. Cl.[3] B41M *3/12*

U.S. Cl. 427—150 6 Claims

1. A process for the production of record material, comprising the steps of:

(a) forming an aqueous dispersion of hydrated zirconia;

(b) formulating said dispersion into a coating composition and applying the coating composition to a substrate web suitable for the production of record material; and

(c) drying the resulting coated web to produce said record material.

4,537,798

SEMI-REFLECTIVE GLAZING COMPRISING A NICKEL-CHROMIUM-MOLYBDENUM ALLOY ANCHORING LAYER

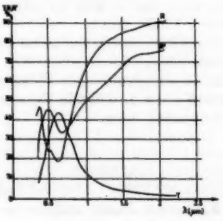
Sabatino Cohen, Sceaux, France, assignor to Saint-Gobain Vitrage, Courbevoie, France

Continuation of Ser. No. 267,528, May 27, 1981, abandoned. This application Aug. 1, 1983, Ser. No. 518,913

Claims priority, application France, Jun. 4, 1980, 80 12449

Int. Cl.[3] B05D *5/06*

U.S. Cl. 427—166 26 Claims



1. In the process for making semi-reflective metallized glasses, the improvement which comprises vacuum depositing an anchoring layer of a nickel base alloy containing at least 3% molybdenum and at least 5 percent chromium by thermal evaporation from an evaporation crucible upon at least one face of a glass substrate, said alloy providing increased deposi-

tion rates, improved properties of the deposit, and the elimination or substantial reduction of corrosion and/or the breakage of said crucible.

4,537,799

SELECTIVE METALLIZATION PROCESS

John K. Dorey, II, Ewing Township, Mercer County; Steven L. Schmidt, Trenton, and Wesley P. Townsend, Princeton Township, Mercer County, all of N.J., assignors to AT&T Technologies, Inc., New York, N.Y.

Filed Apr. 16, 1984, Ser. No. 600,712
Int. Cl.[3] B05D *5/12, 1/32, 3/10*
U.S. Cl. 427—259 **15 Claims**

1. A selective metallization process comprising the steps of providing a patterned mask on a substrate, treating the patterned substrate so as to provide a catalytic layer thereon and electrolessly plating the catalyzed substrate with the patterned mask thereon, including the step of treating the patterned substrate with a weak acid reactant which modifies the surface of the mask without substantial attack or modification of the exposed substrate before catalyzation and prior to electroless plating so as to prevent electroless plating on the mask.

4,537,800

ONE STEP METHOD OF APPLYING POLYSILOXANE AND PTFE COATING COMPOSITION

Edmund J. Kuziemka, Naperville, Ill., assignor to Material Sciences Corporation, Elk Grove Village, Ill.

Division of Ser. No. 527,244, Aug. 29, 1983,. This application Apr. 16, 1984, Ser. No. 600,993
Int. Cl.[3] B05D *3/00, 3/02*
U.S. Cl. 427—327 **15 Claims**

1. A one-step method of applying a fast curing resin coating composition to a metal substrate comprising:

applying a thin film directly to said metal substrate,

said thin film containing an epoxy resin having a molecular weight measured by gel permeation chromatography in the range of from about 300 to about 200,000 present in the range of from about 10% by weight to about 20% by weight of said composition,

not less than about 85% of the epoxy resin having a molecular weight in the range of from about 50,000 to about 200,000,

an effective amount of a cross-linking agent for the epoxy resin,

a polysiloxane resins system present in the range of from about 2% by weight to about 7% by weight of said composition,

an effective amount of a curing agent for the polysiloxane resins system,

polytetrafluoroethylene present in the range of from about 4% by weight to about 15% by weight of said composition, and

the balance being suitable solvents,

the film having a dry thickness in the range of from about 0.7 mils to about 1.2 mils, and

curing the coating by heating the metal substrate to a temperature in the range of from about 450° F. to about 480° F. for a time of not greater than about one minute.

2. The method of claim 1, wherein the metal surface is pretreated with a degreasing agent.

4,537,801

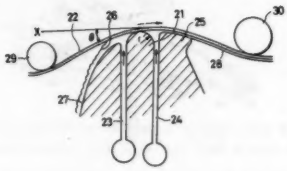
COATING METHOD AND APPARATUS

Hideo Takeda, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 23, 1983, Ser. No. 497,281
Claims priority, application Japan, May 25, 1982, 57-87227
Int. Cl.[3] B05D *3/12*
U.S. Cl. 427—356 **6 Claims**

1. In coating method which comprises applying a solution to a continuously running web, the improvement wherein the web is run along a stationary metering member having a curved smooth surface at the upper end in such a manner that said web is in contact with said smooth surface, a solution which is substantially the same in composition as the coating solution is continuously supplied to the web at a position which is before said metering member to wet the surface of the web to be coated and a predetermined quantity of coating solution is continuously supplied to the web at a position which is after said metering member.

2. In coating apparatus for coating a continuously running web, the improvement wherein the apparatus comprises a stationary metering member having a curved smooth surface at



the upper end, a web wetting solution supplying slot which is located before the metering member, a coating solution supplying slot which is positioned after the metering member, a smoother which is disposed after the coating solution supplying slot, and a source of a solution which is substantially the same in composition as the coating solution, said solution of substantially the same composition continuously supplied through the web wetting solution supplying slot to the web which is run continuously along the upper surfaces of the metering member and the smoother while the coating solution is continuously supplied to the web through the coating solution supplying slot.

4,537,802

FLOOR FINISHING, CLEANING AND BURNISHING COMPOSITIONS CONTAINING UCON POLYMERS, AND METHOD OF USE

John J. Flanagan, #3 Summit Dr., Dune Acres, Ind. 46304

Filed Aug. 31, 1984, Ser. No. 646,137
Int. Cl.[3] C09G *1/04, 1/16;* **C11D** *3/37, 3/43*
U.S. Cl. 427—368 **1 Claim**

1. The method of cleaning, burnishing and reconditioning a plastic and plastic coated floor surfaces and other floor surface to which a floor finish has been applied, said method comprising

applying to the floor surface an aqueous composition including about 0.1 to about 2.0 parts by weight of an ethyl ether of a water-soluble linear polymer of ethylene oxide and propylene oxide having a viscosity in Saybolt Universal Seconds (S.U.S.) at about 100° F., in the range of from about 50 to about 90,000,

about 0.01 to about 1.5 parts by weight of a glycol ether,

about 0.01 to about 0.5 parts by weight of a surfactant different from said linear polymer,

and about 1 to about 200 parts by weight of water,

distributing said composition over the floor surface to wet the surface,

impressing frictional scrubbing forces to the wet surface to generate heat,

continuing the application of heat-generating frictional forces to the floor surface to effect a burnishing and polishing of the floor finish, and

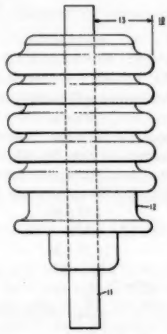
mechanically distributing the polymer of ethylene oxide and propylene oxide and the glycol ether of the composition over the heated floor surface to establish a contiguously intimate residual microfilm thereon to effect a partial plasticization of the floor finish and to improve gloss.

4,537,803

RESINS CONTAINING A LOW VISCOSITY ORGANOPOLYSILOXANE LIQUID DIELECTRIC AND A METHOD OF INSULATING A CONDUCTOR THEREWITH

Thomas W. Dakin, Boca Raton, Fla.; Stanley A. Studniarz, Murrysville, Pa., and Terrence E. Chenoweth, Watkinsville, Ga., assignors to Westinghouse Corp., Pittsburg, Pa.

Filed May 24, 1984, Ser. No. 613,672
Int. Cl.[3] B05D *3/02;* B32B *15/08, 27/38*
U.S. Cl. 427—385.5 5 Claims



1. A completely cured insulating composition disposed about at least one conductor, said cured insulating composition necessarily having minute voids therein and/or having minute voids at the composition-conductor interface, said cured composition being a completely cured admixture of ingredients, the admixture comprising:

(A) a liquid, polymerizable organic resin system selected from the group consisting of epoxy, polyurethane and polyester resin systems;

(B) a low viscosity, liquid, non-polymerizable organopolysiloxane dielectric filler having the structural formula:

$$(R)_3—Si[OSi(R)_2]_nOSi(R)_3,$$

where n=0 to about 10, and each R group is selected from H, alkyl having from 1 to 6 carbons, and phenyl; and

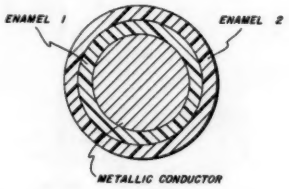
(C) solid, inorganic filler particles, where the admixture contains from about 2 wt.% to about 15 wt.% liquid, organopolysiloxane dielectric based on the total weight of (A), (B) and (C), and from about 20 wt.% to about 85 wt.% solid, inorganic filler particles based on the total weight of (A), (B) and (C), and the liquid organopolysiloxane dielectric is from about 60% to about 95% soluble in the liquid, organic resin system; where the completely cured insulating composition is an organic resin matrix containing liquid organopolysiloxane dielectric, where the liquid organopolysiloxane dielectric remains non-polymerized, having precipitated out of solution as a liquid, and flows or diffuses through the resin matrix to fill the voids within the insulating composition or at the insulating composition-conductor interface, and where the liquid organopolysiloxane dielectric in the completely cured insulating composition will flow or diffuse to fill voids caused by thermal cycling or voltage stress which may occur after complete curing of the composition.

4,537,804

CORONA-RESISTANT WIRE ENAMEL COMPOSITIONS AND CONDUCTORS INSULATED THEREWITH

John J. Keane, Ballston Lake, and Denis R. Pauze, Scotia, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Division of Ser. No. 374,844, May 5, 1982,. This application Jul. 25, 1983, Ser. No. 517,187
Int. Cl.[3] B05D *5/12;* B32B *9/00*
U.S. Cl. 427—118 5 Claims



1. A method of providing a corona-resistant two stage insulated electrical conductor comprising:

coating said conductor with a composition consisting essentially of a polyimide, polyester, polyamideimide, polyesterimide, or polyetherimide resin and curing said resin to form a continuous first layer around said conductor; and

thereafter applying a second coating of a composition consisting essentially of a polyimide, polyamide, polyester, polyamideimide, polyesterimide or polyetherimide resin around said first layer and curing said resin to form a continuous second layer,

wherein said first layer and said second layer are formed from a different resin and wherein either the first layer resin, the second layer resin, or both contains from approximately 1% to approximately 35% by weight of alumina particles of a size less than approximately 0.1 micron dispersed therein by high shear mixing.

4,537,805

REACTIVE PLASTISOL DISPERSION

Shiow C. Lin, Columbia, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed Mar. 26, 1984, Ser. No. 593,500
Int. Cl.[3] B05D *3/06*
U.S. Cl. 427—54.1 27 Claims

1. A reactive plastisol dispersion composition comprising

(1) at least one acrylonitrile-butadiene-styrene (ABS) copolymer in particle form having a particle size in the range from about 0.01 to about 1,500 microns;

(2) a liquid reactive plasticizer member of the group consisting of (a) at least one epoxide resin having an average of more than one epoxide group in the molecule, (b) at least one liquid monomer, oligomer or prepolymer characterized by (1) containing at least one ethylenically unsaturated group and (2) capable of solvating the ABS copolymer at the fluxing temperature, and (c) a mixture of (a) and (b), said liquid reactive plasticizer being present in an amount ranging from 5 to 2,000 parts by weight; and

(3) 0.01 to 10% by weight of either a thermal initiator or photoinitiator for group member plasticizers present in the composition.

4,537,806

COMPACT ORNAMENT

Muriel Sherrard, 213 Ninth St., Hicksville, N.Y. 11801

Filed Oct. 29, 1984, Ser. No. 665,743
Int. Cl.[3] B44F *1/00*
U.S. Cl. 428—7 6 Claims

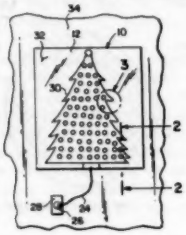
1. A compact ornament connectable to a power source and

which is self storing, easily attached, and may be used as scenery, a room divider, a replacement in screen tracks of windows, a space saver, and a sliding glass door, comprising:

(a) a flat planar non-conductive plate member containing a plurality of apertures;

(b) a plurality of sockets embedded in said plurality of apertures of said flat planar non-conductive plate member and arranged in a predetermined pattern;

(c) a plurality of light bulbs, each light bulb of said plurality of light bulbs being removeably mounted to each socket of



said plurality of sockets so that said each light bulb is easily replaceable;

(d) a printed circuit embedded in said flat planar non-conductive plate member and to which said plurality of socket are electrically connected in parallel so that when at least one light bulb of said plurality of light bulbs burn out the remaining at least one light bulb will stay lit; and

(e) means for electrically connecting said printed circuit to the power source so that said plurality of light bulbs can be illuminated for viewing.

4,537,807

BINDER FOR PRE-MOISTENED PAPER PRODUCTS

Lock-Lim Chan, Willowdale, and Patrick W. Lau, Scarborough, both of Canada, assignors to The Borden Company, Limited, Willowdale, Canada

Filed Apr. 16, 1984, Ser. No. 600,543

Claims priority, application Canada, Nov. 18, 1983, 441431

Int. Cl.³ B32B *7/10*

U.S. Cl. 428—74 **21 Claims**

1. A pre-moistened paper product characterized by having high initial wet strength when wetted with a solution having an acid pH and yet which has substantially lower wet strength when disposed of in a neutral or alkaline pH solution comprising a sheet of non-woven fibrous webs which are bonded together with a binder comprising a copolymer of glyoxal and polyvinyl alcohol, and which is subsequently wetted with an aqueous acid solution to form a bonded sheet of pre-moistened paper.

4,537,808

ELECTRICALLY CONDUCTIVE COMPOSITE MATERIAL

Susumu Yamamoto, and Kazuyoshi Sato, both of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Apr. 23, 1984, Ser. No. 602,984

Claims priority, application Japan, May 7, 1983, 58-79730

Int. Cl.³ B32B *15/08*; F16F *3/00*; H01C *3/10*

U.S. Cl. 428—36 **6 Claims**

1. An electrically conductive composite comprising:

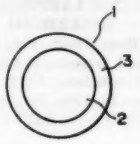
a copper or copper alloy core;

an iron- or nickel-base alloy clad material surrounding the core;

the cross-sectional ratio of the clad material to core is within the range of: $0.1 \leqq Se/(Se+Scu) \leqq 0.8$ where:

Se is the cross-sectional area of the clad material,

Scu is the cross-sectional area of the copper-core and,



the tensile strength P in kg/mm is within the range of:

$230-1.9(100Scu+2.3Se)/(Se+Scu) \leqq P \leqq 80-0.4(100Scu+2.3Se)/(Se+Scu)$.

4,537,809

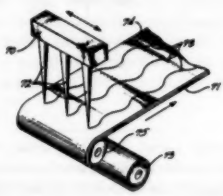
VAN LABEL HAVING NON-LINEAR DISCONTINUOUS SCORE LINES IN THE BACKING

T. Liem Ang, South Pasadena; Donald Van Arnam, Ontario, and Earl McFeaters, La Crescenta, all of Calif., assignors to Avery International Corporation, Pasadena, Calif.

Continuation-in-part of Ser. No. 28,165, Apr. 9, 1979, abandoned, which is a continuation-in-part of Ser. No. 893,002, Apr. 3, 1978, abandoned. This application Jul. 20, 1983, Ser. No. 515,948

Int. Cl.³ B32B *3/30, 7/06*

U.S. Cl. 428—41 **19 Claims**



1. An adhesive laminate comprising:

(a) a base web having a coating of pressure-sensitive adhesive on at least one major surface and a backing removably adhered to the coating of pressure-sensitive adhesive for protecting and containing the pressure-sensitive adhesive; and

(b) at least one non-linear, discontinuous score line extending across the backing and intersecting two edges of the backing, the score line comprising scored segments, wherein a portion of the backing has been cut, of from about 0.01 to about 0.5 inch in length and a depth of at least 80 percent of the thickness of the backing, separated by unscored segments of from about 0.005 to about 0.06 inch in length, said non-linear, discontinuous score line having a wavelength of from about 0.5 to about 6 inches and an amplitude of from about 0.03 to about 1.0 inch, said backing of the laminate having both crackability and pull-across.

4,537,810

METALLIC ENDLESS PRESS BAND HAVING AN EMBOSSED SURFACE FOR USE IN DOUBLE BAND PRESSES IN THE MANUFACTURE OF LAMINATES

Kurt Held, Alte Str. 1, D-7218 Trossingen 2, Fed. Rep. of Germany

Filed Dec. 15, 1983, Ser. No. 561,636

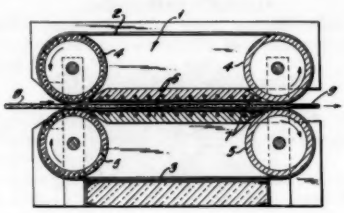
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1982, 3247145

Int. Cl.³ B22D *11/06*

U.S. Cl. 428—156 **1 Claim**

1. In an endless metallic press band having an embossing pattern thereon particularly for use in double band presses for the manufacture of laminates having textured surfaces, said

endless band being formed with a transverse weld seam, the improvement comprising that said endless band consists essentially of a material which is a metal alloy wherein said metal alloy is selected from the group consisting of beryllium-copper alloy, copper-cobalt-beryllium alloy and copper-nickel-beryllium alloy, which can be precipitation hardened or altered in its crystal structure by heat or radiation treatment and that after hardening, or after treatment, the metal structure at the welding seam is identical with the unwelded base material to the extent that no hardness and crystal structure differences which might impair the texture depth result when texturing the surface by knurling, etching or mechanical engraving.

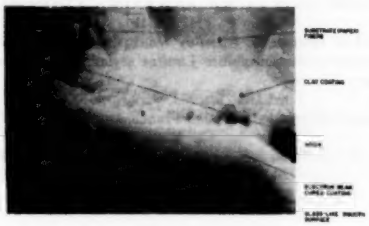


4,537,811

ELECTRON BEAM IRRADIATING PROCESS FOR RENDERING ROUGH OR TOPOGRAPHICALLY IRREGULAR SURFACE SUBSTRATES SMOOTH; AND COATED SUBSTRATES PRODUCED THEREBY

Sam V. Nablo, Lexington, Mass., assignor to Energy Sciences, Inc., Bedford, Mass.

Filed Apr. 24, 1978, Ser. No. 899,493
Int. Cl.³ B05D *3/06*
U.S. Cl. 428—166 **50 Claims**



1. A process for providing a substrate with an adhered coating of controlled penetration and predetermined external surface texture, that comprises, applying an electron-beam-curable, thin, low viscosity, solid coating to a surface of the substrate; subjecting the coated substrate to electron-beam energy after a dwell time following the applying of the coating adjusted to be sufficiently short to prevent the coating from relaxing into conformity with the substrate surface and from substantial penetration into the substrate, said dwell time being within the range of the order of one second down to fractions thereof; and adjusting the electron beam energy to sufficient value, dose, coverage and penetration thereupon rapidly to cure the coating uniformly throughout its thickness and extent in adhering engagement with the substrate, and with an external coating surface of controlled defect-free texture.

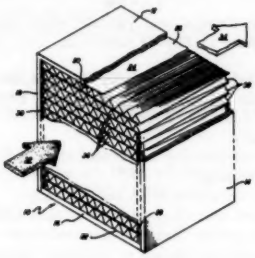
19. A coated substrate product having, in combination, a substrate of relatively rough texture; a thin electron-beam-cured coating adhered to, but not substantially penetrating and contouring to the rough texture of the substrate; said coating having its external surface cured into glass-like smoothness and its inner surface separated with voids between portions of the substrate and the inner surface of the coating.

4,537,812

CORRUGATED SPACERS FOR PLEATED AIR FILTER MEDIA

Richard W. Elbers, Syracuse, N.Y., assignor to Cambridge Filter Corporation, Syracuse, N.Y.

Division of Ser. No. 505,541, Jun. 17, 1983,. This application Dec. 16, 1983, Ser. No. 562,372
Int. Cl.³ B32B *3/28, 3/02*
U.S. Cl. 428—182 **5 Claims**



1. An article of manufacture in the form of a corrugated spacer for pleated filter media, said spacer comprising:

(a) a rectangular sheet of aluminum having a thickness between about 1 to 2 mils and a hardness of not less than H19;

(b) said sheet being folded in zig-zag fashion with successive folds at evenly spaced intervals forming a succession of V formations along each of first and second opposite edges of said sheet;

(c) the amplitude and frequency of said V formations along said first edge being substantially constant, first and second dimensions respectively;

(d) the number of said V formations within a given linear width along said second edge being five times the number within the same width along said first edge, whereby the amplitude and frequency of said V formations along said second edge are substantially 1/5 of said first and second dimensions respectively;

(e) the fold lines forming said V formations along said first edge extending completely between said first and second edges, parallel to one another and to the third and fourth edges of said sheet; and

(f) wherein the fold lines forming said V formations along said second edge, in addition to said fold lines extending completely between said first and second edges, extend from said second edge for about 80% to 90% of the distance to said first edge, at which point they merge into the surface of said sheet, substantially parallel to one another and to said fold lines extending completely between said first and second edges, said spacer being essentially free of cracks and breaks.

4,537,813

PHOTOMASK ENCAPSULATION

Birol Kuyel, Hopewell Township, Mercer County, N.J., assignor to AT&T Technologies, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 425,834, Sep. 27, 1982, abandoned. This application Apr. 25, 1983, Ser. No. 488,315
Int. Cl.³ G03F *1/00*; H01L *21/30*
U.S. Cl. 428—209 **4 Claims**

1. A photomask comprising:

a light transmissive, selectively metallized baseplate; and

a plasma deposited, electrically resistive SiO_2 coating conformally covering the baseplate wherein the coating is a

lossy dielectric and has substantially the same refractive index as the baseplate.

4,537,814

RESIN ARTICLE HAVING A CERAMICS COATING LAYER

Toshiyasu Itoh, Kasugai, and Takaaki Mori, Handa, both of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Jan. 26, 1984, Ser. No. 574,256
Claims priority, application Japan, Jan. 27, 1983, 58-11852
Int. Cl.³ B32B *27/08, 27/30*
U.S. Cl. 428—217 **5 Claims**

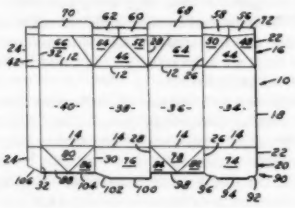
1. A resin article having a ceramics coating layer thereon, said article comprising:
- a resin substrate formed in an uniform shape,
- an intermediate layer made of a cross-linked acrylate having a hardness greater than said resin substrate at least partially covering the surface of said resin substrate, and
- a ceramics coating layer formed on the surface of said intermediate layer.

4,537,815

LAMINATED PAPERBOARD CONTAINER WITH ABSORPTION RESISTANCE MEANS, AND BLANK FOR CONSTRUCTING SAME

Daniel J. Wise, Columbus, Ohio, and Donna M. Woodhall, Livonia, Mich., assignors to Ex-Cell-O Corporation, Troy, Mich.

Continuation-in-part of Ser. No. 479,603, Mar. 28, 1983, Pat. No. 4,489,112. This application Mar. 9, 1984, Ser. No. 587,748
Int. Cl.³ B32B *21/06*
U.S. Cl. 428—219 **4 Claims**



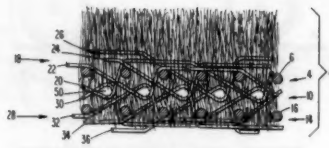
1. A one-piece foldable, laminated blank for forming a sealed liquid container, said blank comprising:
- (a) a layer of fluorochemically treated paperboard weighing between 250 and 500 grams per square meter;
- (b) a layer of selected ionomer resin weighing in the range of 35–60 grams per square meter and forming a uniform coating on one surface of said layer of treated paperboard;
- (c) a layer of an intermediate adhesive weighing in the range of 10–20 grams per square meter and forming a uniform coating on the other surface of said layer of treated paperboard;
- (d) a layer of aluminum foil weighin between 16 and 25 grams and secured to said layer of adhesive; and
- (e) first and second layers of thermoplastic material weighing in the ranges of 15–35 and 12–24 grams per square meter, respectively, and forming uniform inner and outer coatings on said layer of ionomer resin and said layer of aluminum foil, respectively.

4,537,816

PAPERMAKERS SUPERIMPOSED FELT WITH VOIDS FORMED BY REMOVING YARNS

Ian K. Booth, Clinton, and Francis J. Cunnane, III, Laurens, both of S.C., assignors to Ascoe Felts, Inc., Clinton, S.C.

Continuation of Ser. No. 484,575, Apr. 13, 1983, abandoned. This application Oct. 10, 1984, Ser. No. 659,277
Int. Cl.³ B32B *5/02*
U.S. Cl. 428—234 **22 Claims**



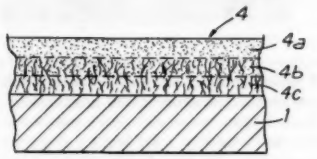
1. A papermaker's felt comprising at least:
- a first yarn system of machine direction yarns defining a first plane;
- a second yarn system of cross machine direction yarns interwoven with said first yarn system in said first plane and extending freely beyond said first plane into a second plane adjacent to said first plane;
- a third yarn system of machine direction yarns defining a third plane adjacent to said second plane;
- a fourth yarn system of cross machine direction yarns interwoven with said third yarn system in said third plane and extending freely above said third plane and into said second plane and cooperating with said second yarn system to define a plurality of void in said felt; and
- a batt needled adjacent to said first plane and having portions thereof extending into said first, second and third planes and retaining said planes relative to each other.

4,537,817

WATERPROOF FABRIC AND FABRICATION METHOD THEREOF

Jean-Luc Guillaume, Ste Foy les Lyon, France, assignor to Societe a Responsabilite Limitee styled: Speri-France, Melisey, France

Filed Dec. 6, 1983, Ser. No. 558,489
Claims priority, application France, Dec. 8, 1982, 82 20594
Int. Cl.³ B32B *7/00*
U.S. Cl. 428—260 **18 Claims**



1. A waterproof fabric fabricated by the textile substrate having interstices less than 1 mm wide being taut and coated on one side with a thin film of liquid synthetic material and the whole is treated to solidify said film, wherein said film consists of an acid solution containing between 20 percent and 30 percent of a polyamide by weight, and is applied to said textile substrate to a depth of at least 50 microns by spreading in liquid form, whereafter the action of the acid solution on said textile substrate is immediately neutralized and the polyamide of said solution is coagulated by running the coated fabric product through a base bath, and the fabric is thereupon washed in water and dewatered, wherein said coagulated film adjacent to said textile substrate has elongated pores extending transversely to said film, said pores open to said textile substrate, and said coagulated film adjacent its surface away from said

fabric substrate has smaller, open ovoid pores communicating with both said surface and said elongated pores.

4,537,818

METHOD FOR PRODUCTION OF CERAMIC OXIDE AND CARBIDE BODIES BY POLYMER INCLUSION AND DECOMPOSITION

Thomas C. Quinby, Kingston, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 30, 1984, Ser. No. 645,653
Int. Cl.³ C01B *31/07*
U.S. Cl. 428—262 **32 Claims**

1. Process for the preparation of a thin, free-standing metal oxide film comprising:

(a) absorbing cations of a metal which forms a stable oxide on a thin film of polymeric material selected from the group consisting of carboxymethylcellulose, viscose rayon and cellophane;

(b) drying the film of cation-impregnated polymeric material;

(c) heating the dried film of cation-impregnated polymeric material in an inert atmosphere to form a carbonized membrane; and

(d) oxidizing the carbonized membrane to yield a thin, self-supporting, metal oxide membrane.

4,537,819

SCRUB-WIPE FABRIC

Walter E. Schortmann, West Hartford, Conn., and Dennis Metrick, Natick, Mass., assignors to The Kendall Company, Boston, Mass.

Filed Dec. 5, 1984, Ser. No. 678,303
Int. Cl.³ D04N *1/46*
U.S. Cl. 428—284 **11 Claims**

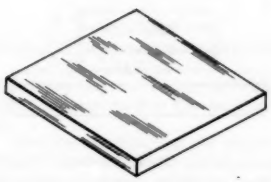
1. A composite wipe fabric comprising: a reticulated foam sheet material disposed in a surface-to-surface relation to at least one layer of a nonwoven web, said foam material and said web being hydroentangled together so as to cause portions of said foam to penetrate said web as bristles protruding therefrom.

4,537,820

INSULATION BOARD AND PROCESS OF MAKING

Jeffert J. Nowobilski, Orchard Park, and William J. Owens, Kenmore, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Nov. 1, 1983, Ser. No. 547,669
Int. Cl.³ B32B *15/00*
U.S. Cl. 428—285 **19 Claims**



1. Insulation board having a density less than 30 pounds per cubic foot and capable of bearing a load, produced by a process comprising:

(a) providing a stack of substantially binderless glass fiber sheets in an amount sufficient to achieve insulation board of desired density less than 30 pounds per cubic foot;

(b) providing a press to compress the stack;

(c) heating the stack and the press to a temperature in the range of from the glass strain temperature to less than the glass softening temperature for a time period sufficient to achieve thermal equilibration of the stack and the press surface;

(d) thereafter compressing the stack by applying a light vertically compressive force of from 0.2 to 5.0 pounds per square inch to the stack with the press, at said thermal equilibrium for a time period sufficient to produce insulation board of desired density and to substantially relieve stress within the board; and

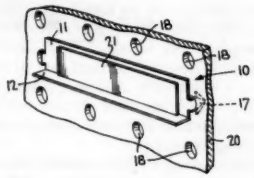
(e) cooling the compressed glass fiber stack to ambient temperature.

4,537,821

MERCHANDISE INFORMATION DISPLAY TAG WITH GUIDE MEANS

Jacob Fast, 6850 NW. 12th Ave., Ft. Lauderdale, Fla. 33309

Filed Jan. 27, 1984, Ser. No. 574,617
Int. Cl.³ G09F *3/02*
U.S. Cl. 428—121 **12 Claims**



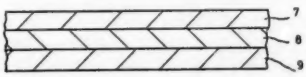
1. An article of manufacture for displaying coded indicia in a manner which permits the indicia to be read by a portable automatic code reading apparatus which is translated along said coded indicia, said article comprising: a plastic sheet having a first section with a display surface on which said coded indicia are to be placed for display, means for guiding and properly positioning said code reading apparatus relative to said coded indicia on said first section when said code reading apparatus is translated along said coded indicia, said means comprising a second section formed integrally with said first section and joined to said first section by a first fold line along which the sheet may be folded to project said second section out of plane with respect to said first section to define a positional guide surface along said second section for said portable code reading apparatus when said code reading apparatus is moved along said display surface to read said coded indicia, and projectional support means formed integrally with said sheet for securing said sheet to a support structure.

4,537,822

THREE-LAYERED FABRIC MATERIAL

Shosuke Nanri, and Kazuyoshi Tsuchida, both of Otsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Feb. 6, 1984, Ser. No. 577,282
Claims priority, application Japan, Feb. 8, 1983, 58-19508
Int. Cl.³ B32B *7/02*
U.S. Cl. 428—212 **10 Claims**



1. A three-layered fabric material composed of a non-woven

fabric of hydrophobic fibers not more than 1 denier in single-filament denier as the inner layer, a fabric of hydrophilic fibers as the intermediate layer and a fabric of hydrophobic fibers larger in denier than the fibers of the intermediate layer as the outer layer.

4,537,823

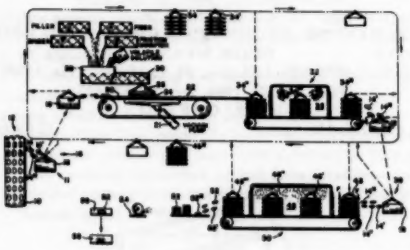
METHOD OF MANUFACTURING A FRICTION ARTICLE

Peter H. Tsang, Union Lake; Joseph P. Coyle, Warren, both of Mich.; Tung Liu, Granger, Ind., and John G. VanderPoorte, St. Clair Shores, Mich., assignors to Allied Corporation, Morristown, N.J.

Filed Nov. 18, 1983, Ser. No. 553,288

Int. Cl.[3] **B32B** *3/26, 5/18;* **B05D** *3/12;* **D04H** *1/64*

U.S. Cl. 428—308.4 **11 Claims**



1. A method of manufacturing a friction article for use in a brake comprising the steps of:

stamping a blank having a predetermined shape from a web of open foamed material selected from a group consisting of carbon, iron, silicon carbide, nickel, and aluminum, said web having voids therein produced by a substantially continuous three dimensional matrix, said three dimensional matrix providing uniform structural rigidity for said blank and a conductive flow path for thermal energy;

placing said blank on a conveyor;

preparing a slurry made up of fillers, modifiers and a liquid binder in a volatile solution;

moving said blank to a location where said slurry fills said voids to create a preformed friction article;

transporting said preformed friction article to a dryer where about fifty percent of said volatile solution is removed without the formation of surface depressions caused by the release of bubbles of gas;

conveying said dried preformed friction article to an oven to cure said binder and form a second matrix which holds said fillers, modifiers, and fibers in said three dimensional matrix; and

applying a force to said preformed friction article during curing to produce a desired density in said friction article.

4,537,824

MAGNETIC RECORDING MEDIUM

Masao Asano; Wataru Fujimatsu; Kazumasa Matsumoto; Hideki Murata; Toshihiko Sato, and Kenji Watanabe, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Mar. 9, 1984, Ser. No. 588,084

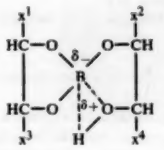
Claims priority, application Japan, Mar. 11, 1983, 58-40087

Int. Cl.[3] **G11B** *5/72, 5/70*

U.S. Cl. 428—323 **12 Claims**

1. In a magnetic recording medium comprising a support having thereon a magnetic layer containing a ferromagnetic powdery material,

said magnetic recording medium comprising at least one layer containing a high-molecular compound having a boron-containing unit having the formula (I):



Formula (I)

wherein at least one of x^1, x^2, x^3 and x^4 has through an oxygen atom a linkage "-O—R-" with a polymer chain, and R is a divalent substituted or unsubstituted hydrocarbon residue.

4,537,825

BONDED COMPOSITES OF A THERMOPLASTIC ELASTOMERIC BLEND WITH A VULCANIZED EPOM OR EPM RUBBER COMPOSITION

James F. Yardley, Barton Under Needwood, United Kingdom, assignor to Dunlop Limited, London, England

Filed Oct. 17, 1983, Ser. No. 542,711

Claims priority, application United Kingdom, Oct. 27, 1982, 8230704

Int. Cl.[3] **B32B** *25/08;* **C08L** *23/02;* **B29H** *9/00;* **C09J** *3/12*

U.S. Cl. 428—327 **2 Claims**

1. A bonded composite of

(i) a thermoplastic elastomeric blend of vulcanized ethylene/propylene/diene monomer terpolymer rubber particles not more than 50 microns in size dispersed in a thermoplastic linear crystalline polyolefin continuous phase, with

(ii) a vulcanized ethylene/propylene/diene monomer terpolymer or ethylene/propylene copolymer rubber composition containing less than 50% by volume of rubber, made by a method which comprises fusing the thermoplastic elastomeric blend and solidifying it in contact with the vulcanized rubber composition in the absence of an adhesive interlayer.

4,537,826

ELECTROCHROMIC DISPLAY ELEMENT

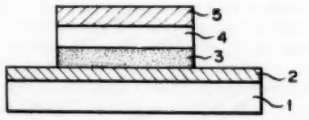
Masataka Miyamura, Kamakura; Masanori Sakamoto, Kawasaki, and Yuko Nakajima, Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 8, 1983, Ser. No. 502,322

Claims priority, application Japan, Jun. 29, 1982, 57-110863; Jun. 29, 1982, 57-110864; Nov. 24, 1982, 57-204520

Int. Cl.[3] **B32B** *15/04;* **C09K** *1/10;* **G02F** *1/17*

U.S. Cl. 428—328 **17 Claims**



1. An electrochromic display element comprising

(a) a first layer consisting essentially of an electrochromic material comprising a transition metal oxide, and

(b) a second layer in contact with said first layer, said second layer consisting essentially of (i) a light-transmissive organic

polymeric resin and (ii) an inorganic material which is ion-conductive.

4,537,827

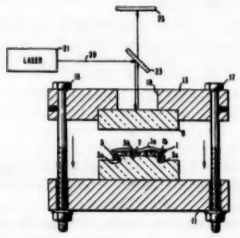
OPTICALLY FLAT SEMICONDUCTOR BASEPLATE STRUCTURE

Michael J. Little, Tarzana; Roger H. Brown, Burbank; Uzi Efron, Los Angeles, and Clarence P. Hoberg, Pacific Palisades, all of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Continuation of Ser. No. 464,442, Feb. 7, 1983, Pat. No. 4,470,856. This application May 18, 1984, Ser. No. 611,808

Int. Cl.³ B32B *7/00;* **G01B** *11/06*

U.S. Cl. 428—409 **6 Claims**



1. An optical baseplate structure comprising:

(a) a baseplate having a top surface;

(b) a layer of solidified fluid adhesive adjacent said baseplate top surface; and

(c) a semiconductor member having first and second major surfaces, said second major surface being adjacent said solidified fluid adhesive layer, said semiconductor member being held thereby in a stressed condition such that said first major surface is substantially optically flat.

4,537,828

LAMINATES COMPRISING PLASTICIZED POLYVINYL BUTYRAL INTERLAYERS

I. Luis Gomez, Longmeadow, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 12, 1983, Ser. No. 522,929

Int. Cl.³ B32B *27/36, 9/04*

U.S. Cl. 428—412 **7 Claims**

1. In a laminate comprising at least one sheet of thermoplastic resin selected from the group consisting of polycarbonate and polyacrylate laminated to a polyvinyl butyral sheet plasticized with a multiester of an alcohol having 2 to 4 hydroxyl groups and a C_{16} to C_{20} unsaturated fatty acid having a hydroxyl group attached to the acid molecule, the improvement which comprises, in property improving combination with such multiester, a synergistically effective amount of an additional plasticizer in said polyvinyl butyral sheet which is a monoester of a glycol and said C_{16} to C_{20} unsaturated fatty acid, wherein the ratio of said monoester to said multiester is between about 1:1 to about 5:1.

4,537,829

CURABLE SILICONE COMPOSITIONS COMPRISING RESINS

John D. Blizzard, Bay City, and Terence J. Swihart, Essexville, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Sep. 20, 1984, Ser. No. 652,936

Int. Cl.³ B32B *9/00*

U.S. Cl. 428—429 **48 Claims**

1. A composition comprising in combination,

(A) from 1 to 200 parts by weight of the reaction product of

(i) an organosilicon resin consisting essentially of $R_3SiO_{\frac{1}{2}}$ units and $SiO_{4/2}$ units wherein R represents a monovalent hydrocarbon radical and the ratio of R_3SiO_{178} units to $SiO_{4/2}$ units is from 0.6/1 to 0.9/1 and

(ii) a polyorganohydrogensiloxane;

(B) 100 parts by weight of an organosilicon polymer having the formula $R''R_2'SiO(R_2'SiO)_xSiR_2'R''$, wherein each R' is selected from the group consisting of monovalent hydrocarbon radicals, each R'' is selected from the group consisting of OH radicals and R' radicals, x has a value of from 0 to 5000, there being on average at least two radicals of said organosilicon polymer selected from the group consisting of vinyl radicals and hydroxyl radicals;

(C) from 1 to 50 parts by weight of an organosilicon resin consisting essentially of $(CH_3)_2(CH_2{=}CH)SiO_{\frac{1}{2}}$ units, $(CH_3)_3SiO_{178}$ units and $SiO_{4/2}$ units, said units being in a ratio of $(CH_3)_2(CH_2{=}CH)SiO_{\frac{1}{2}}$ units to $(CH_3)_3SiO_{\frac{1}{2}}$ units to $SiO_{4/2}$ units of from 0.10/0.6/1 to 0.25/0.9/1; and

(D) from 0.00003 to 0.035 parts by weight of a hydrosilylation catalyst, said parts being by weight of the metal in the catalyst.

4,537,830

THERMOPLASTIC MOLDING COMPOSITIONS OF POLYVINYLBUTYRAL CONTAINING PLASTICIZER

Hans D. Hermann, Bad Soden am Taunus, and Klaus Fabian, Kriftel, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 31, 1984, Ser. No. 575,711

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1983, 3303111

Int. Cl.³ C08L *29/14;* **C08K** *5/10, 5/52;* **B32B** *17/10*

U.S. Cl. 428—437 **8 Claims**

1. A thermoplastic molding composition based on polyvinylbutyral containing plasticizer, comprising a component mixture of

(A) 65–80% by weight, based on the component mixture, of a polyvinylbutyral containing vinyl alcohol units and

(B) 35–20% by weight, based on the component mixture, of a plasticizer mixture of

(a) 50–99% by weight, based on the plasticizer mixture, of a glycol ester of formula I

$$R_1{-}\overset{\overset{O}{\|}}{C}{-}O{-}(CH_2{-}CH_2{-}O)_n{-}\overset{\overset{O}{\|}}{C}{-}R_2 \qquad (I)$$

in which R_1 and R_2, which can be identical or different, denote aliphatic radicals with in each case 4–10 carbon atoms and n denotes an integer from 2 to 4, and

(b) 50–1% by weight, based on the plasticizer mixture, of a phosphoric acid ester of formula II

$$\begin{array}{l} R_3{-}O \\ R_4{-}O{-}P{=}O \\ R_5{-}O \end{array} \qquad (II)$$

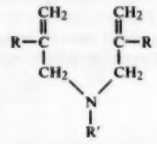
in which R_3, R_4 and R_5, which can be identical or different, denote aliphatic radicals which have in each case up to 18 carbon atoms, optionally contain double bonds and/or optionally contain hetero-atoms and/or optionally contain halogen atoms and can also be substituted, and R_4 and/or R_5 can also denote cycloaliphatic, aromatic or araliphatic radicals with in each case up to 18 carbon atoms.

4,537,831
CROSSLINKING OF CHLORINE-CONTAINING POLYMERS

Frank V. Di Stefano, Macungie, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Feb. 22, 1984, Ser. No. 582,427
Int. Cl.³ C08L *27/04, 27/06, 27/08*
U.S. Cl. 428—514 **16 Claims**

1. A binder composition for nonwovens comprising a chlorine-containing polymer which is a vinyl chloride homopolymer, a vinyl chloride copolymer, a vinylidene polymer or a chlorinated acrylic polymer and, as an amine crosslinking agent, up to 25 wt. % polyamine polymer which is the product of the polymerization of at least one diallylamine of the formula



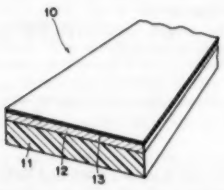
where R is hydrogen or a C_1–C_4 alkyl group and R′ is hydrogen or a methyl group.

9. A nonwoven product comprising a nonwoven fibrous substrate bonded with 5 to 80 wt. % of the binder composition of claim **1**.

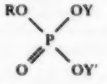
4,537,832
MAGNETIC RECORDING MEDIUM

Osamu Kohmoto, Ichikawa; Yasufumi Takasugi; Hiroshi Sugihara, both of Saku, and Masaharu Nishimatsu, Komoro, all of Japan, assignors to TDK Corporation, Tokyo

Filed Dec. 20, 1983, Ser. No. 563,502
Claims priority, application Japan, Dec. 25, 1982, 57-234816; Oct. 5, 1983, 58-186622; Oct. 6, 1983, 58-187523; Oct. 7, 1983, 58-187965; Oct. 7, 1983, 58-187966
Int. Cl.³ G11B *5/72*
U.S. Cl. 428—216 **21 Claims**



1. A magnetic recording medium comprising a substrate, a continuous thin magnetic layer on the substrate, and a topcoat formed over the magnetic layer deposited by evaporation or sputtering, characterized in that the topcoat consists of a compound having the formula:



where R is selected from alkyl radicals having 10 to 22 carbon atoms, and

Y and Y′ are independently selected from the group consisting of hydrogen atom, alkyl radicals and monovalent cations, and Y and Y′ may together represent a divalent cation.

4,537,833
MAGNETIC RECORDING MEDIUM

Akira Kasuga; Nobuyuki Yamamoto, and Hajime Miyatsuka, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 2, 1984, Ser. No. 606,097
Claims priority, application Japan, May 2, 1983, 58-77840
Int. Cl.³ G11B *5/70*
U.S. Cl. 428—328 **26 Claims**

1. A magnetic recording medium comprising a non-magnetic support having thereon a magnetic recording layer comprising ferromagnetic metal particles and a binder, wherein the ferromagnetic metal particles have a specific surface area of about 35 to about 80 m^2/g, and the magnetic recording layer has a surface roughness of about 0.001 to about 0.04 μm and the residual amount of solvent in the magnetic recording layer is about 0.5 to about 30 mg/m^2.

13. The magnetic recording medium as claimed in claim **1**, wherein the ferromagnetic metal particles have an oxidized layer with a thickness of about 20 Å to about 100 Å.

4,537,834
METAL (II) 4,4′,4″,4‴-PHTHALOCYANINE TETRAAMINES AS CURING AGENTS FOR EPOXY RESINS

Bappalige N. Achar, Mysore, India; George M. Fohlen, Millbrae, and John A. Parker, Los Altos, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation-in-part of Ser. No. 440,656, Nov. 10, 1982, Pat. No. 4,499,260. This application Apr. 11, 1984, Ser. No. 598,777
Int. Cl.³ G08G *59/50*
U.S. Cl. 428—413 **12 Claims**

1. A homogeneous cured polymer of metal 4,4′,4″,4‴-phthalocyanine tetraamine and one or more epoxy compounds.

4,537,835
OXIDATION OF HYDROGEN HALIDES TO ELEMENTAL HALOGENS

Charles A. Rohrmann, Kennewick, and Harold T. Fullam, Richland, both of Wash., assignors to Battelle Memorial Institute, Richland, Wash.

Continuation-in-part of Ser. No. 770,282, Feb. 18, 1977, abandoned. This application May 31, 1978, Ser. No. 911,097
Int. Cl.³ C01B *7/00, 7/07*
U.S. Cl. 423—502 **3 Claims**

1. A process for regenerating chlorine from hydrogen chloride comprising:

in a fused salt contactor which contains only liquids and gases and which is maintained substantially free of sulfur oxide gases, contacting an oxidizing gas comprising molecular oxygen and hydrogen chloride containing substantially no sulfur impurities with a molten salt mixture comprising 5 to 25 wt. percent K_2SO_4 and 50 to 90 wt percent $K_2S_2O_7$ and 2 to 25 wt. percent dissolved V_2O_5 oxidizing catalyst; and

maintaining said salt mixture at a temperature between 275° C. and 475° C., sufficient to oxidize a major portion of said hydrogen chloride, and insufficient to substantially change or alter the balance of the components so that substantially no additions of make up quantities of said components are required and regeneration of said salt mixture outside said reactor is not required, thereby producing a gaseous effluent which contains primarily steam and chlorine along with a smaller amount of unreacted hydrogen chloride and unreacted oxidizing gas and which is substantially free of sulfur oxide gases.

4,537,836

COMPOSITE STRUCTURES

Ashok M. Adur, Wescosville, Pa.; Seymour Schmukler, Palatine, Ill.; John Maconis, Jr., Schaumburg, Ill., and Mitsuzo Shida, Barrington, Ill., assignors to Chemplex Company, Rolling Meadows, Ill.

Division of Ser. No. 510,292, Jul. 1, 1983, Pat. No. 4,487,885, and a continuation-in-part of Ser. No. 468,871, Feb. 22, 1983, abandoned, which is a division of Ser. No. 339,984, Jan. 18, 1982, abandoned, said Ser. No. 510,292, is a continuation-in-part of Ser. No. 339,984, ,. This application Dec. 4, 1984, Ser. No. 677,843

Int. Cl.³ B32B *27/32*

U.S. Cl. 428—522 **59 Claims**

1. A composite structure comprising:

(a) a substrate, and adhered thereto

(b) an adhesive blend consisting essentially of:

(1) about 0.1 to less than about 40 parts by weight in said blend of a graft copolymer of about 70–99.95 wt.% of a polyethylene backbone grafted with about 30–0.05 wt.% of at least one grafting monomer comprising at least one polymerizable ethylenically unsaturated carboxylic acid or carboxylic acid derivative for a total of 100%, and

(2) about 0.1–99 parts by weight in said blend of LDPE, or ethylene-unsaturated ester copolymers, or LLDPE or mixtures thereof, and

(3) about 0.1–60 parts by weight in said blend of a blending component comprising a homopolymer or copolymer, or mixtures thereof, containing greater than about 50 wt.% of an α-olefin of 4–15 carbon atoms, for a total of components (1), (2) and (3) of 100 parts by weight.

4,537,837

CORROSION RESISTANT METAL COMPOSITE WITH METALLIC UNDERCOAT AND CHROMIUM TOPCOAT

Walter H. Gunn, 45 Virginia Dr., Painesville, Ohio 44077, and Alexander W. Kennedy, 11857 Auburn Rd., Chardon, Ohio 44024

Continuation-in-part of Ser. No. 475,734, Mar. 16, 1983, Pat. No. 4,500,610. This application Feb. 13, 1984, Ser. No. 578,010

Int. Cl.³ C23C *1/02;* **C23F** *7/10*

U.S. Cl. 428—621 **21 Claims**

1. A coated metal substrate having enhanced corrosion resistance and protected by a coating composite comprising a thin metallic undercoating layer of a metal combination having at least one metal selected from the group consisting of zinc, nickel, iron, chromium, aluminum and cobalt, and a substantially resin-free topcoat layer from a hexavalent-chromium-containing bonding coating composition heat-curable to a water resistant protective coating, said topcoat layer containing particulate metal as well as above 20 milligrams per square foot of coated metallic undercoating of chromium, as chromium, in non-elemental form, said composition containing hexavalent-chromium-providing-substance in liquid medium.

4,537,838

SYSTEM WITH SEVERAL PANELS CONTAINING PHOTOELECTRIC ELEMENTS FOR THE PRODUCTION OF ELECTRIC CURRENT

Rudolf Jetter, and Heinz Jetter, both of Feldmeilen, Switzerland, assignors to Hartag AG, Basel, Switzerland

PCT No. PCT/CH83/00088, § 371 Date Mar. 5, 1984, § 102(e) Date Mar. 5, 1984, PCT Pub. No. WO84/00253, PCT Pub. Date Jan. 19, 1984

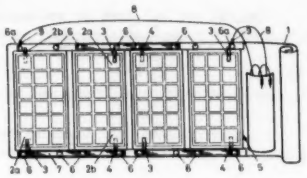
PCT Filed Jul. 5, 1983, Ser. No. 598,278

Claims priority, application Switzerland, Jul. 5, 1982, 4069/82; Sep. 28, 1982, 5694/82

Int. Cl.³ H01M *12/00;* **H01L** *31/06*

U.S. Cl. 429—9 **13 Claims**

1. System with several panels containing electrically interconnected photoelectric elements for the production of electric current, characterized in that the panels are arranged side by side in a compartmented folding pocket open on one side and have an interval between adjoining panels to form at least one folding position, the panels are electrically connected in series and/or parallel connection by means of flexible conductors incorporated into the compartmented folding pocket and extending at least in part over the folding positions and that



connection devices are present to connect the panels mechanically with the conductors and the compartmented folding pocket and to tap voltages and/or electric currents from the conductors.

13. System as in claim 1, wherein the compartmented folding pocket contains at least one flat buffer battery.

4,537,839

FUEL CELL AND METHOD OF PURGING A FUEL CELL

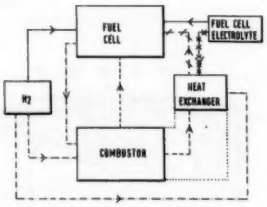
Donald S. Cameron, Reading, England, assignor to Johnson Matthey Public Limited Company, London, England

Filed Nov. 16, 1983, Ser. No. 552,099

Claims priority, application United Kingdom, Nov. 23, 1982, 8233312

Int. Cl.³ H01M *8/22*

U.S. Cl. 429—20 **12 Claims**



1. A fuel cell in combination with a combustor for combusting hydrogen with air to yield a gas stream comprising water vapour and nitrogen optionally together with hydrogen at a concentration below the explosive limit and means for passing the gas stream through the fuel cell as a purge and/or as a preheater or through a heat exchanger for imparting heat to a reactant for the fuel cell or to the fuel cell electrolyte.

4,537,840

FUEL CELL USING ORGANIC, HIGH-MOLECULAR WEIGHT ELECTROLYTE

Tsutomu Tsukui, Hitachi; Toshio Shimizu, Katsuta; Ryota Doi, Naka, and Yasuyuki Tsutsumi, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 1, 1983, Ser. No. 519,264

Claims priority, application Japan, Jul. 30, 1982, 57-132237

Int. Cl.³ H01M *8/08*

U.S. Cl. 429—33 **26 Claims**

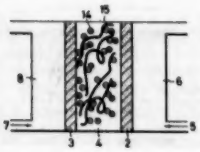
1. A fuel cell, adapted to be operated at a temperature of from room temperature to about 100° C., comprising:

(a) a fuel electrode placed so that a fuel in a fuel chamber is in contact therewith,

(b) an oxidizer electrode placed so that an oxidizer in an oxidant chamber is in contact therewith, and

(c) an electrolyte between said fuel electrode and said oxi-

dizer electrode, the electrodes facing each other via said electrolyte, wherein said electrolyte is an organic, high-molecular weight electrolyte having a molecular weight of at least 1000, which electrolyte is at least partially



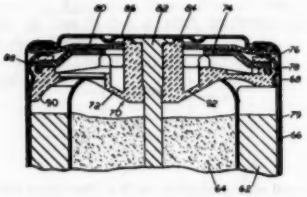
soluble in water thereby to generate low-molecular weight ions and high-molecular weight ions being separated from each other in water, said ions being hardly permeable through the electrodes, whereby leakage of the electrolyte from between the electrodes can be avoided.

4,537,841

METAL-SUPPORTED SEALS FOR GALVANIC CELLS

Marian Wiacek; Charles Markin, and Ronald J. Book, all of Toronto, Canada, assignors to Duracell Inc., Bethel, Conn.

Filed Nov. 4, 1983, Ser. No. 548,740
Int. Cl.³ H01M *2/00*
U.S. Cl. 429—56 **22 Claims**



1. In combination, a cylindrical sealed galvanic cell, having an anode, a cathode, and a generally cylindrical can into which the principal components of the cell are placed, said can having a closed end and an open end; and further comprising a sealing and insulating member at the open end of said can, said member being held in sealing relationship to said can by a crimp formed at the top edge of said can; where:

said sealing and insulating member comprises a molded thermoplastic body portion and a metal disc portion over said thermoplastic body portion, with a space between said disc and said thermoplastic body;

said molded thermoplastic body portion has an inwardly directed shoulder in its periphery subtended by a downwardly and outwardly extending discontinuous skirt portion, which is formed as a plurality of discrete leg-like projections; and

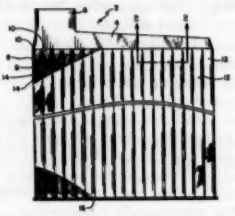
said metal disc has a central opening therein and has an interference fit over a centrally located upwardly extending boss in the upper surface of said thermoplastic body portion, and has at least one opening formed therein to provide a passage for pressure equalization between the outside of said cell and the space between said disc and said molded thermoplastic body.

4,537,842

THIN TUBULAR POSITIVE ELECTRODES FOR LEAD-ACID BATTERIES AND METHOD OF MAKING SAME

Erik G. Sundberg, 447 Union St., Newtown Crossing, Pa. 18940

Filed Jun. 15, 1983, Ser. No. 504,472
Int. Cl.³ H01M *4/76*
U.S. Cl. 429—140 **17 Claims**



1. A positive tubular electrode for a lead-acid battery, the said electrode including a grid structure comprising a top bar, a lug, and a plurality of spaced-apart spines depending from the top bar, a plurality of tube members arranged around the spines such that one spine is enclosed by each tube member, active material portions received in the tube members and the lower ends of the said tube members being closed by a bottom bar part,

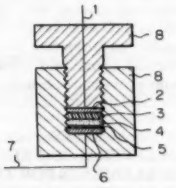
characterized in that the ratio between a calculated weight of formed, dry active material received in each tube member to the weight of the spine enclosed by that tube member is restricted to a maximum value of 1.5:1.

4,537,843

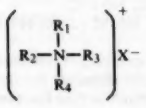
SECONDARY BATTERY

Toshikazu Shishikura; Hiroshi Konuma, both of Yokohama; Hidenori Nakamura, Kawasaki, and Yukio Kobayashi, Sagamihara, all of Japan, assignors to Showa Denko Kabushiki Kaisha and Hitachi, Ltd., both of, Japan

Filed Oct. 22, 1984, Ser. No. 663,540
Claims priority, application Japan, Oct. 26, 1983, 58-199280; Feb. 27, 1984, 59-034175
Int. Cl.³ H01M *10/40*
U.S. Cl. 429—197 **11 Claims**



1. A secondary battery comprising a polymeric compound having conjugated double bonds in the main chain as a material of a negative electrode or a material of positive and negative electrodes, wherein an ammonium salt represented by the following general formula:



wherein R_1, R_2, R_3 and R_4 stand for an alkyl group having 1 to 16 carbon atoms or an aryl group having 6 to 15 carbon atoms, with the proviso that the case where all of R_1, R_2, R_3 and R_4 are the same groups is excluded, and X is an anion, is used as the electrolyte.

4,537,844

ELECTROPHOTOGRAPHIC ELEMENT CONTAINING DISAZO COMPOUND

Mitsuru Hashimoto, Numazu, Japan, assignor to Ricoh Co. Ltd., Tokyo, Japan

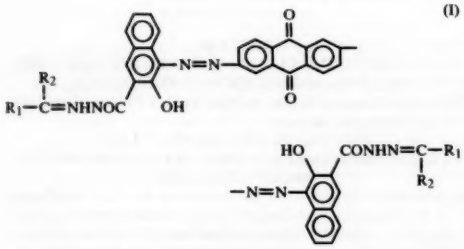
Filed Sep. 28, 1983, Ser. No. 536,924

Claims priority, application Japan, Oct. 8, 1982, 57-177419; Jan. 12, 1983, 58-2310

Int. Cl.³ G03G 5/06, 5/14

U.S. Cl. 430—58 **18 Claims**

1. An electrophotographic element comprising a charge carrier generating layer and a charge transfer layer formed on an electrically conductive substrate, wherein said charge carrier generating layer contains therein a disazo compound represented by the general formula (I):



(I)

wherein, R_1 and R_2 are the same or different and each stands for hydrogen, C_1–C_4 lower alkyl group, a substituted or unsubstituted aralkyl group, a substituted or unsubstituted aromatic group, or a substituted or unsubstituted hetero group, or

forms a ring.

4,537,845

MULTICONDUCTIVE LAYER ELECTROPHOTOGRAPHIC PHOTOSENSITIVE DEVICE AND METHOD OF MANUFACTURE THEREOF

Yoshiyuki Mimura; Takao Okada, and Akitoshi Toda, all of Hachioji, Japan, assignors to Olympus Optical Company Ltd., Japan

Filed Oct. 19, 1983, Ser. No. 543,385

Claims priority, application Japan, Oct. 20, 1982, 57-184189

Int. Cl.³ G03G 5/14

U.S. Cl. 430—58 **10 Claims**

1. An electrophotographic photosensitive device, comprising:

an aluminium substrate conductive layer;

a zinc conductive layer formed on the aluminium conductive layer;

a nickel conductive layer formed on the zinc conductive layer;

a selenium based photoconductive layer formed on the nickel conductive layer; and

a transparent insulating layer formed on the photoconductive layer.

4,537,846

MULTICONDUCTIVE LAYER ELECTROPHOTOGRAPHIC PHOTOSENSITIVE DEVICE AND METHOD OF MANUFACTURE THEREOF

Yoshiyuki Mimura; Takao Okada, and Akitoshi Toda, all of Hachioji, Japan, assignors to Olympus Optical Company, Ltd., Japan

Filed Oct. 19, 1983, Ser. No. 543,285

Claims priority, application Japan, Oct. 20, 1982, 57-184192

Int. Cl.³ G03G 5/14

U.S. Cl. 430—58 **10 Claims**

1. An electrophotographic photosensitive device, comprising:

an aluminium substrate conductive layer;

a zinc conductive layer formed on the aluminium conductive layer;

a silver conductive layer formed on the zinc conductive layer;

a selenium based photoconductive layer formed on the silver conductive layer; and

a transparent insulating layer formed on the photoconductive layer.

4,537,847

DISAZO PHOTORECEPTORS FOR ELECTROPHOTOGRAPHY

Jiro Takahashi; Kiyoshi Sawada, both of Hachioji; Akira Kinoshita, Hino; Tawara Komamura; Satoshi Goto, both of Hachioji, and Osamu Sasaki, Hino, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 435,102, Oct. 18, 1982, abandoned.

This application Aug. 10, 1984, Ser. No. 640,205

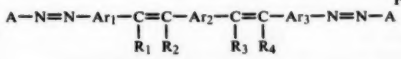
Claims priority, application Japan, Oct. 23, 1981, 56-169554; Feb. 15, 1982, 57-23297

Int. Cl.³ G03G 5/06

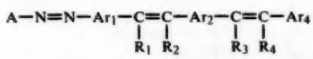
U.S. Cl. 430—58 **15 Claims**

1. A photoreceptor for electrophotography comprising a conductive support and an overlaying photosensitive layer, said photosensitive layer containing a binder and at least one azo compound of Formula I or II

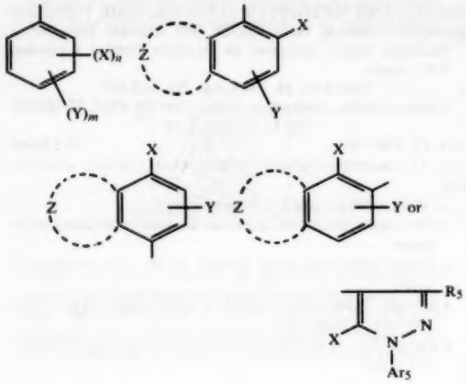
Formula I



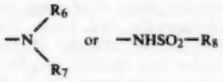
Formula II



wherein Ar_1, Ar_2, Ar_3 and Ar_4 each is an aromatic hydrocarbon ring radical or an aromatic heterocyclic ring radical; R_1, R_2, R_3 and R_4 each is an electron attractive group or hydrogen provided that at least one of R_1, R_2, R_3 and R_4 is an electron attractive group; and A is

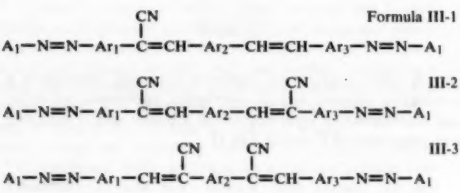


wherein X is a hydroxy group or a group represented by the formula:

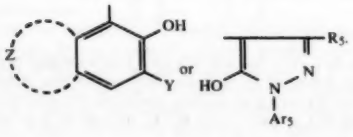


wherein R_6 and R_7 each is hydrogen or an alkyl group, and R_8 is an alkyl or aryl group; Y is halogen, an alkyl or alkoxy group, a carboxy group, a sulfo group, a carbamoyl or sulfamoyl group; Z is an atomic group necessary for making an aromatic hydrocarbon ring or an aromatic heterocyclic ring; R_5 is hydrogen, an amino or carbamoyl group, a carboxy group or an ester group thereof; Ar_5 is an aryl group; n is an integer of 1,2 or 3; and m is an integer of 0, 1 or 2.

7. The photoreceptor of claim 1 wherein said azo compound is selected from the group consisting of Formulas III-1 to III-3



wherein A_1 is



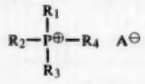
4,537,848

POSITIVELY CHARGED TONER COMPOSITIONS CONTAINING PHOSPHONIUM CHARGE ENHANCING ADDITIVES

Raymond A. Yourd, III; Debesh Majumdar, both of Rochester, and Robert J. Gruber, Pittsford, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 18, 1984, Ser. No. 621,977
Int. Cl.³ G03G *9/12*
U.S. Cl. 430—110 **35 Claims**

1. An improved positively charged toner composition comprised of resin particles, pigment particles, and as a charge enhancing additive in an amount of from about 0.1 percent by weight to about 20 percent by weight a phosphonium compound of the formula:



wherein R_1, R_2, R_3, and R_4, are independently selected from the group consisting of alkyl, aryl, substituted alkyl, and substituted aryl, and A is an anion.

4,537,849

PHOTOSENSITIVE ELEMENT HAVING ROUGHENED SELENIUM-ARSENIC ALLOY SURFACE

Akio Arai, Nagano, Japan, assignor to Fuji Electric Company, Ltd., Kanagawa, Japan

Filed Jan. 18, 1984, Ser. No. 571,860
Claims priority, application Japan, Jan. 25, 1983, 58-11132
Int. Cl.³ G03G *5/08*
U.S. Cl. 430—85 **5 Claims**

1. A photosensitive element for use in electrophotography comprising a photoconductive layer composed of a selenium-arsenic alloy at least at the exposed surface thereof, the exposed surface having a rough surface portion having ridges and grooves in the range from 0.1 to 2 microns in height and 3 microns or less in width created by superfinishing the exposed surface.

4,537,850

PROCESS AND APPARATUS FOR REJUVENATING ELECTROSTATIC COPY MACHINE TONER

Wilfred Smeiman, 33372 Bremerton St., Dana Point, Calif. 92629

Filed Aug. 30, 1983, Ser. No. 527,699
Int. Cl.³ G03G *9/08*; G01R *33/12*; C22C *19/00*
U.S. Cl. 430—137 **12 Claims**

1. A process for rejuvenating toner for electrostatic copy machines comprising:

transferring a used toner having magnetic particles coated with a fusible component to a container;

surrounding said container with an electromagnetic coil;

energizing said electromagnetic coil to apply a pulsed magnetic field to said toner;

timing the output of said electromagnetic coil to optimize the application of said pulsed electromagnetic field for optimum magnetic strength of said toner.

7. Apparatus for rejuvenating toner for electrostatic copy machines comprising:

a hollow core means;

an electromagnetic coil surrounding said hollow core means;

container means containing used toner having magnetic particles coated with a fusible component for placing the toner to be rejuvenated inside said core;

energizing means for energizing said electromagnetic coil to produce a pulsed electromagnetic field to said toner;

timing means for timing the operation of said energizing means to optimize the application of said electromagnetic field for optimum magnetic strength of said toner.

4,537,851

PROCESS OF FORMING POWDER PATTERN USING POSITIVE DIAZONIUM SALT PHOTORESIST

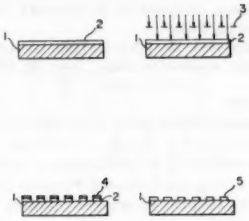
Saburo Nonogaki, Tokyo; Nobuaki Hayashi, Hachioji, and Yoshifumi Tomita, Mobara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 313,170, Nov. 20, 1981, abandoned. This application Sep. 12, 1983, Ser. No. 531,266

Claims priority, application Japan, Oct. 22, 1980, 55-146941

Int. Cl.[3] **G03C** *5/34, 5/18;* **G03F** *7/08, 7/26*

U.S. Cl. 430—144 **44 Claims**



1. A process for forming a powder pattern using a positive-working photoresist, which comprises:

(1) applying a water-soluble, positive-working photoresist composition comprising an admixture of water-soluble aromatic diazonium salt, water soluble phenolic compound, and water-soluble polymeric compound, on a substrate to form a positive-working photoresist film, said composition having sufficient concentration of water-soluble aromatic diazonium salt and phenolic compound, and polymeric compound, such that, upon later contact of the photoresist film with alkaline gas or solution, areas of the film can be rendered at most only sparingly water-soluble;

(2) exposing the applied film to a prescribed pattern of actinic ray to decompose the diazonium salt in exposed areas;

(3) contacting the resultant exposed film with an alkaline gas or solution to cause a reaction of the diazonium salt with the phenolic compound in unexposed areas to render the unexposed areas of the film at most only sparingly water-soluble, to form a treated film, said alkaline gas or solution having a sufficient concentration so as to make the unexposed area of the film sufficiently uniformly at most only sparingly water-soluble so as to dissolve only exposed areas of the film upon development;

(4) developing the film, having been contacted with the alkaline gas or solution, with water to remove the film in exposed areas and form a positive-working resist image having a powder pattern; and

(5) contacting a powder with the film to adhere thereto, the contacting with a powder being performed at any time after said applying a water-soluble, positive-working photoresist composition, up to being performed simultaneously with said developing;

whereby fogging of the powder pattern on the substrate using a positive-working photoresist is avoided.

4,537,852

PROCESS FOR THE PRODUCTION OF HUMAN UROKINASE

Kaname Sugimoto, Okayama, Japan, assignor to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo, Okayama, Japan

Filed Nov. 12, 1981, Ser. No. 320,746

Claims priority, application Japan, Dec. 5, 1980, 55-171588

Int. Cl.[3] **C12N** *9/72, 15/00, 5/00;* **C12R** *1/91*

U.S. Cl. 435—215 **22 Claims**

1. A process for producing human urokinase, comprising:

fusing parent human cells inherently capable of producing human urokinase with a human lymphoblastoid line to obtain hybridoma cells capable of producing human urokinase;

implanting said hybridoma cells in an immunodeficient or immunosuppressed non-human warm-blooded animal;

feeding the animal to allow said hybridoma cells to utilize the nutrient body fluid of the animal for their multiplication;

extracting and disaggregating the resultant tumor, formed in the animal, to obtain the multiplied hybridoma cells;

culturing the multiplied hybridoma cells on an in vitro nutrient medium in the presence of an effective amount of a urokinase inducer under conditions appropriate to accumulate a substantial amount of human urokinase; and

recovering the accumulated human urokinase from the culture.

4,537,853

PHOTOGRAPHIC SILVER HALIDE MATERIAL CONTAINING A BALLASTED ELECTRON-DONOR PRECURSOR COMPOUND

Christian C. Van de Sande, Belsele; André Verhecken, Mortsel, and Wilhelmus Janssens, Aarschot, all of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

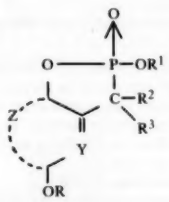
Filed Feb. 21, 1984, Ser. No. 581,723

Claims priority, application European Pat. Off., Mar. 15, 1983, 83200353.7

Int. Cl.[3] **G03C** *5/54, 1/42, 5/30;* **C07F** *9/02*

U.S. Cl. 430—218 **11 Claims**

10. An image receiving material useful in diffusion-transfer-reversal processing with exposed silver halide emulsion layer(s), wherein said material contains in a water-permeable binder layer an EDP-compound corresponding to the general formula:



wherein:

R represents hydrogen or a substituent which an hydrolytic removal allows the replacement of R by H,

R^1, R^2 and R^3 (same or different) represent a hydrocarbon group or R^3 represents hydrogen, and

Z and Y represent the necessary atoms to close a benzene ring, or Z and Y represent the necessary atoms to form a fused ring system including said benzene ring, at least one of R^1, R^2, R^3, Z and Y being or including a ballast group making said EDP-compound non-diffusing in a hydrophilic colloid layer when permeated by an alkaline aqueous liquid.

4,537,854

PHOTORESIST COMPOSITIONS AND METHOD

James V. Crivello, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 14, 1983, Ser. No. 531,977

Int. Cl.[3] **G03C** *1/70*

U.S. Cl. 430—283 **8 Claims**

1. A water soluble photocurable photoresist composition which is based on a simultaneous cationic and free radical cure between alkanol acrylamide and a water soluble hydroxyl functional film forming organic oligomer comprising a blend of by weight,

(A) 50 to 98% of a solvent and
(B) 2 to 50% of a photoresist composition comprising
(i) 100 parts of water soluble hydroxyl functional film forming organic oligomer,
(ii) 50 to 100 parts of an alkanolacrylamide,
(iii) an effective amount of an onium salt which is sufficient to effect the cure of the photocurable photoresist compositions selected from the class consisting of

$[Ar_2I]^+[MF]_d^-$ and

$[Ar_3S]^+[MF]_d^-$

where Ar is selected from $C_{6-13)}$ aromatic monovalent hydrocarbon radical and substituted aromatic monovalent hydrocarbon radical, M is a metalloid selected from phosphorous, arsenic and antimony and d is an integer equal to 4–6 inclusive.

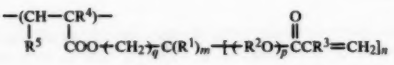
4,537,855

PHOTOPOLYMERIZABLE PHOTOSENSITIVE COMPOSITION

Hiroshi Ide, Yokohama, Japan, assignor to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Oct. 11, 1983, Ser. No. 540,868
Claims priority, application Japan, Oct. 18, 1982, 57-182471
Int. Cl.³ G03C 1/68
U.S. Cl. 430—285 **25 Claims**

1. A photopolymerizable photosensitive composition comprising:
(a) a photopolymerizable photosensitive high molecular weight compound having polyfunctional ethylenically unsaturated groups in the side chains or end groups thereof, wherein said polyfunctional ethylenically unsaturated groups have structural units of the general formula



wherein R^1 represents a hydrogen atom, alkyl group or hydroxyalkyl group, R^2 represents an alkylene group, R^3 and R^4 independently represent a hydrogen atom or methyl group, R^5 represents a hydrogen atom or carboxyl group, m is 0 or 1 and n is 2 or 3 provided that $m+n=3$, p is an integer of 1 to 3, and q is an integer of 0 to 3 and
(b) a photopolymerization initiator.

3. A photopolymerizable photosensitive composition according to claim 1, further comprising an ethylenically unsaturated compound.

4,537,856

METHOD OF PROCESSING SILVER HALIDE COLOR PHOTOGRAPHIC MATERIALS

Masayuki Kurematsu, Hachioji, and Shigeharu Koboshi, Sahamihara, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Apr. 5, 1984, Ser. No. 596,871
Claims priority, application Japan, Apr. 5, 1983, 58-58692; Apr. 7, 1983, 58-59980
Int. Cl.³ G03C 7/40
U.S. Cl. 430—372 **23 Claims**

1. A method of processing a silver halide color photographic material which comprises
(a) imagewise exposing said material,
(b) then developing said material,
(c) then treating said material with one of a bleach-fixing solution or a fixing solution, each of said bleach-fixing solution and said fixing solution containing an organic acid iron (III) complex salt, and
(d) then, without washing with water, treating said material with a stabilizing solution containing a water-soluble chelate compound of at least one metal selected from a first group consisting of Ba, Ca, Ce, Co, In, La, Mn, Ni, Pb, Ti, Sn, Zn, and Zr, and a second group consisting of Mg, Al, and Sr,
wherein said chelate compound of a metal from said first group is present in an amount of 1×10^{-4} to 1×10^{-1} mole per liter of said stabilizing solution and said chelate compound of a metal from said second group is present in an amount of 1×10^{-4} to 3.5×10^{-2} mole per liter of said stabilizing solution.

4,537,857

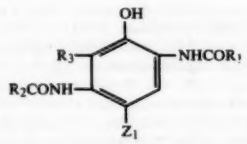
SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Shun Takada; Kaoru Onodera, and Takashi Kadowaki, all of Odawara, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Nov. 29, 1983, Ser. No. 556,129
Claims priority, application Japan, Nov. 30, 1982, 57-210219
Int. Cl.³ G03C 7/26
U.S. Cl. 430—549 **20 Claims**

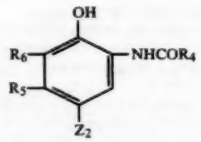
1. A silver halide photographic light-sensitive material comprising a support having thereon at least one silver halide emulsion layer containing in combination at least one of those cyan couplers having the following Formula [I] and at least one of those cyan couplers having the following Formula [II]:

Formula [I]

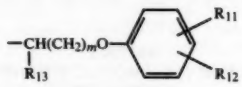


wherein R_1 is an aryl radical, a cycloalkyl radical or a heterocyclic radical; R_2 is an alkyl radical, a phenyl radical, or R_8—X-R_9—$_n$ wherein R_8 represents an alkyl or aryl radical, R_9 represents an alkylene radical, n represents an integer of 0 to 5, and X represents a divalent radical selected from the group consisting of —O—, —CO—, —COO—, —OCO—, —SO_2N-R′—, —NR′SO_2NR″—, —S—, —SO— and —SO_2— wherein R′ and R″ represent an alkyl radical; R_3 is a hydrogen atom, a halogen atom, an alkyl radical or an alkoxy radical; and Z_1 is a hydrogen atom, a halogen atom, or a radical that can be split off by the reaction of said coupler with the oxidized product of an aromatic primary amine-type color devloping agent,

Formula [II]



wherein R_4 is an alkyl radical or



wherein R_{11} and R_{12} may be either the same or different from each other and each is a hydrogen atom, an alkyl radical or an alkoxy radical, provided that the sum of the carbon atoms of R_{11} and R_{12} is from 8 to 16, R_{13} is a hydrogen atom or an alkyl radical, and m is an integer of 0 to 2; R_5 is an alkyl radical; R_6 is a hydrogen atom, a halogen atom, or an alkyl radical; and Z_2 is a hydrogen atom, a halogen atom, or a radical that can be split off by the reaction of said coupler with the oxidized

product of an aromatic primary amine-type color developing agent.

4,537,858

PLASTATIN

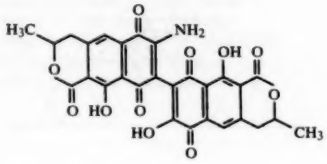
Joseph O'Sullivan, Belle Mead; Carol A. Aklonis, North Brunswick, and Pushpa Singh, Piscataway, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jun. 22, 1984, Ser. No. 623,306

Int. Cl.[3] C12P *17/18;* **C12N** *1/20;* **C07D** *311/92*

U.S. Cl. 435—119 **4 Claims**

1. Plastatin, having the structural formula



and pharmaceutically acceptable salts thereof.

2. A process for preparing plastatin which comprises cultivating *Penicillium chermesinum* A.T.C.C. No. 20700 in an aqueous nutrient medium containing an assimilable carbohydrate and nitrogen source under submerged aerobic conditions until substantial phospholipase A_2 inhibitory activity is imparted to the medium.

4. A biologically pure culture of the microorganism *Penicillium chermesinum* A.T.C.C. No. 20700, said culture being capable of producing plastatin in a recoverable quantity upon fermentation in an aqueous nutrient medium containing an assimilable carbohydrate and nitrogen source.

4,537,859

PROCESS FOR PREPARING 3-HYDROXY-ML-236B DERIVATIVES KNOWN AS M-4 AND M-4'

Akira Terahara, and Minoru Tanaka, both of Hiromachi, Japan, assignors to Sankyo Company, Limited, Tokyo, Japan

Filed Nov. 18, 1982, Ser. No. 442,840

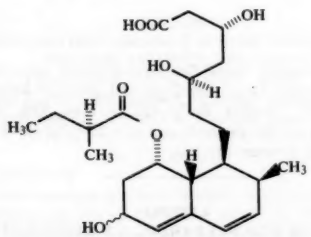
Claims priority, application Japan, Nov. 20, 1981, 56-186641

The portion of the term of this patent subsequent to Oct. 18, 2000, has been disclaimed.

Int. Cl.[3] C12P *7/42, 7/62;* **C12N** *1/20*

U.S. Cl. 435—146 **22 Claims**

1. A process for preparing a compound of formula (I):



(I)

wherein ~~OH represents ▬ OH or ⁞⁞⁞ OH, pharmaceutically acceptable salts and esters thereof and the corresponding ring-closed lactones, which process comprises contacting an ML-236B compound selected from the group consisting of ML-236B carboxyic acid, salts and esters thereof and the corresponding ML-236B lactone with a hydroxylation enzyme produced by a microorganism of the genus Nocardia to produce the hydroxylated ML-236B compound of the formula (I).

4,537,860

STATIC CELL CULTURE MAINTENANCE SYSTEM

William R. Tolbert, Manchester; Joseph Feder, University City, and Charles Lewis, Jr., Hazelwood, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 8, 1982, Ser. No. 447,748

Int. Cl.[3] C12M *1/12, 1/04, 3/00, 1/00;* **B07B** *1/30;* **B07C** *5/16;* **C12N** *5/00, 5/02*

U.S. Cl. 435—240 **9 Claims**

7. Apparatus for maintaining animal cells in vitro in a substantially arrested state of proliferation with continuous secretion of cell product which comprises a housing, a chamber within said housing for holding cells in a semi-rigid matrix of finely divided particles with interstices for passage of fluid culture media, external culture medium inlet and outlet means disposed in a wall in said housing, said inlet means being in fluid communication with at least one first porous tube disposed substantially throughout the length or width of said chamber, said outlet means being in fluid communication with at least one second porous tube disposed substantially throughout the length or width of said chamber, external gas inlet and outlet means disposed in a wall in said housing and in gaseous communication with a selectively-permeable membrane disposed substrantially throughout the expanse of said chamber, said first and second porous tubes having closures at their ends within said chamber which are distal to the external culture medium inlet and outlet means, and said second porous tube having a pore size larger than the pore size of said first porous tube, wherein the pore size of the first porous tube is from about 0.2 to abut 5μ and wherein the pore size of the second porous tube is from about 10μ to about 150μ.

4,537,861

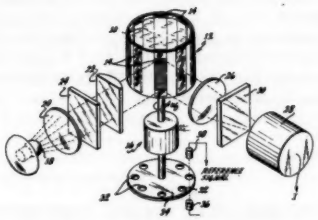
APPARATUS AND METHOD FOR HOMOGENEOUS IMMUNOASSAY

Virgil B. Elings, P.O. Box 6463, Santa Barbara, Calif. 93111, and David F. Nicoli, 448 Mills Way, Goleta, Calif. 93017

Filed Feb. 3, 1983, Ser. No. 463,658

Int. Cl.[3] G01N *33/54, 33/58*

U.S. Cl. 436—518 **67 Claims**



1. Apparatus for providing an immunoassay of a binding reaction between an ligand and an antiligand, including

a spatial pattern formed by a predetermined known spatially periodic array of stripes of antiligand material and with the stripes having a predetermined width and spacing,

ligand material dispersed to interact with the spatially periodic array of stripes of antiligand material for producing a binding reaction between the ligand and the antiligand in the spatial pattern of stripes,

means for labeling the binding reaction with a particular physical characteristic,

a source of input energy and with the input energy at a particular spectrum for interacting with the particular physical characteristic of the labeled binding reaction,

means for scanning the spatial pattern with the input energy at the particular spectrum for producing output energy having amplitude levels formed by a substantially random background component and a periodic component representing the labeled binding reaction, and

means responsive to the output energy for detecting the periodic component representing the labeled binding reaction and for producing an output signal in accordance with the labeled binding reaction.

4,537,862

LEAD-FREE AND CADMIUM-FREE GLASS FRIT COMPOSITIONS FOR GLAZING, ENAMELING AND DECORATING

Josef Francel; Uriah Horn, both of Toledo, and Daniel R. Stewart, Maumee, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 392,974, Jun. 28, 1982, Pat. No. 4,446,241. This application Apr. 27, 1984, Ser. No. 604,560

The portion of the term of this patent subsequent to May 1, 2001, has been disclaimed.

Int. Cl.³ C03C *1/00*

U.S. Cl. 501—14 **17 Claims**

1. A glass frit composition having a fiber softening point of at least about 535° C., the composition being free of lead, cadmium, and zinc, the composition consisting essentially of the following components in approximate weight percents:

Component	%
SiO_2	25–32
B_2O_3	25–32
ZrO_2	10–18
Rare earth oxide	10–18
Li_2O	0–9
Na_2O	0–9
K_2O	0–5
SrO	0–6
F	0–3
CaO	0–3
SnO_2	0–2
WO_3	0–10

in which the ratio of ZrO_2 to rare earth oxide is about 1:1 to 1.4:1, the amount of ZrO_2+rare earth oxide is about 20 to 33 and the amount of Li_2O, K_2O and Na_2O is about 1 to 10, the composition having an alkali resistance of less than about 1% (5% sodium pyrophosphate at 60° C. for 8 hours) and an acid resistance of less than about 1.9% (4% by weight acetic acid for 24 hours at room temperature).

4,537,863

LOW TEMPERATURE SEALING COMPOSITION

Ichiro Matsuura, and Fumio Yamaguchi, both of Shiga, Japan, assignors to Nippon Electric Glass Company, Ltd., Otsu, Japan

Filed Aug. 10, 1983, Ser. No. 521,896

Int. Cl.³ C03C *7/02*

U.S. Cl. 501—15 **5 Claims**

1. A low temperature sealing composition for a seal of high mechanical strength between two alumina ceramic parts to form a sealed package having a shearing strength of at least 310 kg, the sealing composition having a sealing temperature of no more than 450° C. and consisting essentially of a mixture of 50–80 wt.% of a vitreous solder glass powder of PbO-B_2O_3 system having a deformation point of 350° C. or less, 1–35 wt.% of a first ceramic powder and 1–45 wt.% of a second ceramic powder, the total amount of said first and second ceramic powders being 20–50 wt.%, said first ceramic powder consisting of 68–75 wt.% ZnO, 23–28 wt.% SiO_2 and up to 8 wt.% Al_2O_3, and said second ceramic powder consisting of 98–99.9 wt.% SnO_2 and 0.1–2 wt.% ZnO.

4,537,864

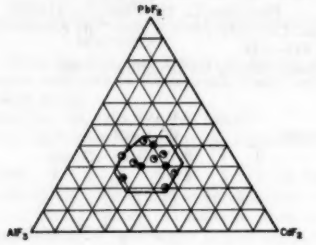
METAL FLUORIDE GLASSES IN THE CdF_2-PbF_2-ALF_3-(LIF) SYSTEM

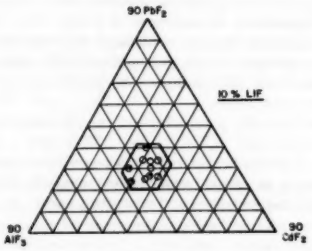
Paul A. Tick, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

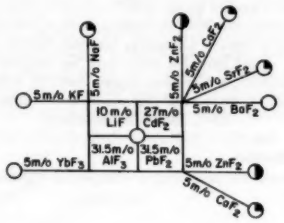
Filed Aug. 31, 1983, Ser. No. 528,256

Int. Cl.³ C03C *3/18*

U.S. Cl. 501—30 **7 Claims**







1. A non-oxide, metal-fluoride-containing glass-forming composition comprising, in mole percent, about 20–46% CdF_2, 22–52% AlF_3, 18–44% PbF_2, and at least 80% total of CdF_2+AlF_3+PbF_2, the mole ratio of CdF_2:PbF_2 in the composition being greater than 1:2.

4,537,865

PROCESS FOR PREPARING A PARTICULATE CERAMIC MATERIAL

Shinsei Okabe; Hiroshi Komatsu; Yukio Hamaji; Shozo Kojima, and Yoshiharu Kato, all of Kyoto, Japan, assignors to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

Filed Jul. 11, 1984, Ser. No. 629,846

Int. Cl.³ C04B *35/46*

U.S. Cl. 501—135 **4 Claims**

1. A process for preparing a particulate ceramic material comprising the steps of:

(a) adding carbon dioxide or an aqueous solution of a soluble carbonate to first aqueous solution of a nitrate or chloride of Ba, Sr, Ca or Mg in a first vessel to adjust the pH of said first aqueous solution to between 7 and 10 thereby forming a carbonate precipitate;
(b) adding an aqueous solution of a soluble hydroxide to a second aqueous solution of a nitrate or chloride of Ti, Zr, Sn or Pb in a second vessel to adjust the pH of said second aqueous solution to between 7 and 10 thereby forming a hydroxide precipitate;
(c) combining slurries containing the precipitates formed in said first and second vessels;
(d) mixing the combined slurries;
(e) passing the slurries through a filter;
(f) washing the filter cake with water;
(g) drying the filter cake to form a powder;
(h) calcining the dried powder; and
(i) grinding the calcined powder.

4,537,866

METHOD OF PREPARING SILICATE COMPOSITION

Jean-Pierre Gilson, Buffalo Grove, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Mar. 29, 1984, Ser. No. 594,590
Int. Cl.³ B01J *21/08, 29/04*
U.S. Cl. 502—70 **35 Claims**

1. A method of preparing a silica-containing composition comprising the steps of:
(a) forming a shaped particle of a lithium silicate sol;
(b) heating the particle to a temperature of about 70° C. or more in the absence of a gelling agent to form a gel while maintaining the shape thereof; and,
(c) subjecting the shaped particle to a washing step prior to cooling of said gel to a temperature of less than 70° C. to remove lithium therefrom and thereby prevent reversion of said gel to said sol.

8. The method of claim **1** further characterized in that the lithium silicate sol has dispersed therein an alumina source.

9. The method of claim **1** further characterized in that the lithium silicate sol has dispersed therein a molecular sieve.

4,537,867

PROMOTED IRON-COBALT SPINEL CATALYST FOR FISCHER-TROPSCH PROCESSES

Rocco A. Fiato, Scotch Plains; Stuart L. Soled, Madison, and Angelo A. Montagna, Summit, all of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Dec. 14, 1983, Ser. No. 561,292
Int. Cl.³ B01J *23/78*
U.S. Cl. 502—74 **19 Claims**

1. A hydrocarbon synthesis catalyst composition comprising an unsupported, Group IA or IIA metal salt promoted iron-cobalt single phase spinel, said spinel having the initial empirical formula:

$$Fe_xCo_yO_4$$

wherein x and y are integer or decimal values, other than zero, with the proviso that the sum of x+y is 3 and the ratio of x/y is 7:1 or above, said spinel exhibiting a powder X-ray diffraction pattern substantially isostructural with Fe_3O_4 and said spinel having an initial BET surface area of up to about 5 m^2/g.

4,537,868

CATALYST CONTAINING AN AROMATIC SILICON COMPOUND FOR THE POLYMERIZATION OF ETHYLENE

Karel Bujadoux, Lens, and Jean-Marie Neyer, Behren Les Forbach, both of France, assignors to Societe Chimique des Charbonnages S.A., Paris, France

Continuation of Ser. No. 326,195, Dec. 1, 1981, abandoned. This application Mar. 28, 1984, Ser. No. 594,415
Claims priority, application France, Dec. 2, 1980, 80 25519
Int. Cl.³ C08F *4/64, 4/68, 4/62*
U.S. Cl. 502—104 **12 Claims**

1. A catalyst for the polymerization or copolymerization of ethylene comprising at least one halogenated compound of a transition metal of Groups IV to VI of the Periodic System, said metal being in the trivalent state in said compound, and at least one aromatic silicon compound having the formula $\phi_n Si(OH)_{4-n}$, in which ϕ is an aromatic or polyaromatic ring compound having from 6 to 15 carbon atoms and $1 \leqq n \leqq 3$, said aromatic silicon compound being present in a molar ratio of between 0.2 and 2 inclusive with respect to said transition metal, wherein said aromatic or polyaromatic ring compound may have one or more hydrocarbon radicals substituted on the aromatic or polyaromatic rings of said compound.

11. A process for the manufacture of a catalyst according to claim **1** in which the halogenated transition metal compound is suspended in an aliphatic, cycloaliphatic or aromatic hydrocarbon solvent and then the aromatic silicon compound is added to the suspension in the quantity desired in relation to the transition metal.

4,537,869

TETRAVALENT TITANIUM TREATED CALCINED VANADIUM CATALYST WITH TRIALKYLALUMINUM COCATALYST

Max P. McDaniel, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 19, 1984, Ser. No. 672,634
Int. Cl.³ C08F *4/64*
U.S. Cl. 502—107 **13 Claims**

1. A method of producing a catalyst comprising:
(a) impregnating a vanadium compound onto a particulate refractory support;
(b) subjecting the thus supported vanadium composition to calcination;
(c) thereafter contacting the thus calcined supported vanadium catalyst with a titanium component selected from $TiCl_4$ and $TiORCl_3$ wherein R is a 1 to 10 carbon atom alkyl group; and
(d) contacting the resulting catalyst with a trihydrocarbylaluminum cocatalyst.

4,537,870

POLYOLEFIN POLYMERIZATION PROCESS AND CATALYST

Gil R. Hawley, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 12, 1984, Ser. No. 630,172
Int. Cl.³ C08F *4/64, 4/66*
U.S. Cl. 502—111 **12 Claims**

1. A process for preparing a catalyst comprising (1) reacting (a) a metal dihalide selected from Groups IIA and IIB, (b) a transition metal compound, wherein the transition metal is selected from Groups IVB and VB transition metals and is bonded to at least one atom selected from the group consisting of oxygen, nitrogen, and sulfur, said atom in turn being bonded to the carbon atom of an organic radical, and (c) at least one electron donor to form a first catalyst component; (2) reacting said first catalyst component with an organoaluminum precipitating agent selected from compounds of the general formula

$$AlR_nX_{3-n}$$

wherein each R is individually selected from saturated and unsaturated hydrocarbyl radicals containing 1 to 20 carbon atoms per radical, X is halogen, an n is any number such that $1 \leqq n \leqq 2$; then (3) reacting the resulting solid with $TiCl_4$, and (4) then reacting that resulting solid with $HSiCl_3$.

4,537,871

CARBONYLATION CATALYST

Nabil Rizkalla, River Vale, N.J., assignor to The Halcon SD Group, Inc., New York, N.Y.

Division of Ser. No. 429,925, Sep. 30, 1982, Pat. No. 4,483,803. This application Apr. 23, 1984, Ser. No. 602,648

Int. Cl.³ B01J *27/08, 27/06, 31/20;* **C07C** *51/14*

U.S. Cl. 502—161 **1 Claim**

1. A liquid-phase carbonylation catalyst consisting essentially of a molybdenum-nickel-alkali metal, tungsten-nickel-alkali metal, or chromium-nickel-alkali metal co-catalyst component and a halide component represented by the following formula: X:T:Z:Q, wherein X is molybdenum, tungsten or chromium, T is nickel, X and T being in zero valent form or in the form of a halide, an oxide, a carboxylate of 1 to 20 carbon atoms, a carbonyl or an hydride; Z is a halide source which is hydrogen halide, halogen, or an alkyl halide wherein the alkyl group contains 1 to 20 carbon atoms, and Q is the alkali metal component and is in the form of an iodide, a bromide, a chloride or a carboxylate as defined for X and T, the molar ratio of X to T being 0.1–10:1, the molar ratio of X+T to Q being 0.1–10:1, and the molar ratio of Z to X+T being 0.01–0.1:1.

4,537,872

PROCESS FOR PREPARING A HYDROCARBON REFORMING CATALYST

Tadashi Ohmori, Yokohama; Tokuo Fujisó, Yokosuka; Eiji Yasui, Yokohama; Soichi Nomura, Tokyo, and Yukio Aizawa, Kawasaki, all of Japan, assignors to Nippon Oil Company, Limited, Tokyo, Japan

Filed Apr. 23, 1984, Ser. No. 602,751

Claims priority, application Japan, Apr. 28, 1983, 58-73842; Dec. 1, 1983, 58-225434

Int. Cl.³ B01J *23/36, 23/42, 27/06*

U.S. Cl. 502—230 **12 Claims**

1. A process for preparing a hydrocarbon reforming catalyst, utilizing as a precursor a rhenium compound and platinum carbonyl cluster complex salt of the general formula

$$[P+_3(CO)_8]_n^{2-} \cdot 2M^+$$

wherein n is an integer of 1–5, M^+ is a cation selected from the group consisting of Li^+, Na^+, K^+, Rb^+, Cs^+, NH_4 or quaternary alkyl amine cation; which process comprises supporting on an inorganic porous carrier the platinum carbonyl cluster complex salt in an amount of 0.01 to 5% by weight as platinum metal, and the rhenium compound in an amount of 0.01 to 5% by weight as rhenium metal and a halogen in an amount of 0.2 to 5% by weight, and then subjecting the resultant catalyst precursor to a thermal decomposition treatment and a reduction treatment.

4,537,873

CATALYST FOR CATALYTIC COMBUSTION

Akira Kato, Hitachi; Tomoichi Kamo, Ibaraki; Shigeo Uno, Hitachi; Hiroshi Kawagoshi, Hitachi; Hisao Yamashita, Hitachi, and Shinpei Matsuda, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 29, 1983, Ser. No. 556,049

Claims priority, application Japan, Nov. 29, 1982, 57-207749; Mar. 4, 1983, 58-34380

Int. Cl.³ B01J *21/06*

U.S. Cl. 502—242 **18 Claims**

17. A catalyst for catalytic combustion consisting of precious metal particles of at least one member selected from the group consisting of platinum, palladium, ruthenium, iridium and rhodium and at least one member selected from the group consisting of nickel, cobalt, manganese and chromium supported on a carrier obtained from (a) a first component of titania and (b) a second component of at least one metal oxide selected from the group consisting of oxides of magnesium, strontium, lanthanum, yttrium, cerium, silicon and tin; the compositional ratio of the first component titania to the second component metal oxide being 1:0.05 to 1:<1 in atomic ratio of Ti:metal of the second component. A catalyst according to claim 17, wherein the amount of the precious metal particles if from 0.1 to 3% by weight based on the weight of the carrier.

4,537,874

CATALYST FOR PRODUCTION OF UNSATURATED ALDEHYDES

Takahisa Sato; Masahiro Takata, both of Himeji; Michio Ueshima, Nishinomiya, and Isao Nagai, Suita, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co Ltd, Osaka, Japan

Filed Oct. 18, 1983, Ser. No. 543,150

Claims priority, application Japan, Oct. 22, 1982, 57-184668; Jul. 27, 1983, 58-135740

Int. Cl.³ B01J *23/16, 21/02, 27/14, 23/84*

U.S. Cl. 502—311 **2 Claims**

1. A catalyst for the production of unsaturated aldehydes, said catalyst being represented by the general formula

$$Bi_aW_bFe_cMo_dA_eB_fC_gD_hO_x$$

wherein Bi represents bismuth, W represents tungsten, Fe represents iron, Mo represents molybdenum, O represents oxygen, A represents nickel (Ni) and/or cobalt (Co), B represents at least one element selected from the group consisting of alkali metals, alkaline earth metals and thallium, C represents at least one element selected from the group consisting of phosphorus (P), arsenic (As), boron (B), antimony (Sb), tin (Sn), cerium (Ce), lead (Pb) and niobium (Nb), D represents at least one element selected from the group consisting of silicon (Si), aluminum (Al), zirconium (Zr) and titanium (Ti), a, b, c, d, e, f, g, h and x represent the atomic ratios of the individual elements, and when d is taken as 12, a=0.1–10.0, b=0.5–10.0 (provided that a/b=0.01–6.0), c=0.1–10.0, e=2.0–20.0, f=0.001–10.0, g=0–10.0, and h=0–30, and x takes a number determined by the atomic valences of the individual elements; said catalyst having been calcined in air at a temperature of from 400° C.–600° C.

the Bi component being introduced thereinto in the form of a bismuth tungstate obtained beforehand by calcining a mixture of a bismuth compound and a tungsten compound at a temperature of 600° to 900° C.

4,537,875

CRUSHED CATALYSTS CONTAINING ALUMINA, SILICA OR SILICA-ALUMINA, AND PROCESS FOR THEIR MANUFACTURE

Hervé Toulhoat, Le Pecq; Jean-Claude Plumail, Le Vesinet; Marc Mercier, Ales, and Yves Jacquin, Sevres, all of France, assignors to Societe Francaise des Produits pour Catalyse Pro-Catalyse, Rueil-Malmaison, France

Filed Dec. 27, 1983, Ser. No. 565,557

Claims priority, application France, Dec. 24, 1982, 82 21854

Int. Cl.³ B01J *29/10*

U.S. Cl. 502—314 **9 Claims**

1. A process for manufacturing a catalyst consisting essentially of at least one alumina, silica or silica-alumina carrier and at least one active element selected from vanadium and the metals of groups VI and VIII and compounds of said metals, said process comprising the steps of shaping said carrier as extrudates, calcining said extrudates at about 300°–1000° C., coarsely crushing said calcined extrudates and recovering resultant crushed particles of average size from 0.05 to 0.5

times the diameter of said calcined extrudates, introducing said at least one active element into said recovered crushed particles, and calcining resultant catalyst particles at about 300°-1000° C.

4,537,876

ACTIVATION OF CATALYSTS FOR SYNTHESIZING METHANOL FROM SYNTHESIS GAS

David B. Blum, 108 Tall Oaks Dr., Wayne, N.J. 07470, and Abraham P. Gelbein, 45 Headley Rd., Morristown, N.J. 07960

Filed Nov. 29, 1983, Ser. No. 556,032
Int. Cl.[3] B01J *21/04, 23/06, 23/72*
U.S. Cl. 502—342 5 Claims

1. A method for activating a methanol synthesis catalyst for use in a liquid phase methanol process comprising:

forming a slurry of solid metal oxide catalyst particles in an inert liquid, in a methanol synthesis reactor; and

activating said catalyst by reducing said catalyst particles with a reducing gas stream containing at least 25% hydrogen at a temperature in the range of between 150°-300° C. and a pressure in the range of between 200 and 7,000 kPa at a reducing gas stream volumetric flow rate in the range of between 750 and 3000 liters per hour per kilogram of catalyst.

4,537,877

PARTICULATE OIL-ABSORBING COMPOSITION TO ABSORB OIL

Thomas Ericsson, Molndal, Sweden, assignor to Papyrus Kopparfors AB, Molndal, Sweden

Filed May 10, 1983, Ser. No. 493,393
Claims priority, application Sweden, May 10, 1982, 8202932
Int. Cl.[3] B01J *20/22*
U.S. Cl. 502—402 10 Claims

1. A particulate oil-absorbing composition which in dust form displays a low explosion hazard and a low flammability, but which after absorption of oil is flammable and entirely consumed when burned, the particles consisting essentially of as the major component at least 50% by weight hydrophobic cellulose pulp fibers in admixture with at least 30% up to 50% of an inorganic cellulose paper pulp filler.

4,537,878

PROCESS FOR USING ENDOGENOUS ENKEPHALINS AND ENDORPHINS TO STIMULATE THE IMMUNE SYSTEM

Nicholas P. Plotnikoff, Tulsa, Okla., assignor to TNI Pharmaceuticals, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 308,287, Oct. 5, 1981,. This application Apr. 6, 1984, Ser. No. 597,378
Int. Cl.[3] A61K *37/00;* C07C *103/52*
U.S. Cl. 514—2 11 Claims

1. A process for stimulating the T-cell and NK cell immune activity comprising the step of administering in vivo an endogenous endorphin.

4,537,879

A47934 ANTIBIOTIC AND PROCESS FOR PRODUCTION THEREOF

Robert L. Hamill, Greenwood, and Ralph E. Kastner, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 403,842, Jul. 30, 1982, Pat. No. 4,462,942. This application Jun. 22, 1984, Ser. No. 607,864
Int. Cl.[3] A61K *37/00*
U.S. Cl. 514—9 10 Claims

1. A method of increasing the efficiency of feed utilization by ruminant animals having a developed rumen function which comprises the oral administration to such animals of a propionate-increasing amount of antibiotic A47934, or a pharamaceutically-acceptable, non-toxic salt thereof.

4,537,880

AMINOPROPYLAMINOBLEOMYCIN DERIVATIVES AND PROCESS FOR PREPARATION THEREOF

Hamao Umezawa, Tokyo; Akio Fujii, Kanagawa; Yasuhiko Muraoka, Saitama; Tokuji Nakatani, Saitama; Takeyo Fukuoka, Saitama, and Katsutoshi Takahashi, Tokyo, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

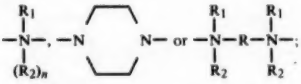
Continuation-in-part of Ser. No. 453,254, Dec. 27, 1982, abandoned. This application Jul. 27, 1984, Ser. No. 635,096
Claims priority, application Japan, Dec. 29, 1981, 56-210449
Int. Cl.[3] A61K *37/00;* C07C *103/52*
U.S. Cl. 514—19 10 Claims

1. An aminopropylaminobleomycin represented by the following general formula or a salt thereof:

wherein

[BX] represents the bleomycin acid acyl group;

A is



R_1 and R_2 are independently lower alkyl or benzyl;

R is lower alkylene;

n is the integer 0 or 1; and

B has the formula

wherein

(i) R_3 is hydrogen and R_4 is

(a) benzyl substituted by one or more halogen atoms, provided that the benzyl is substituted by two halogen atoms when R_1 is lower alkyl,

(b) benzyl substituted by cyano, two or more alkoxy groups or two or more benzyloxy groups,

(c) lower alkyl substituted by cycloalkyl or anthranyl,

(d) phenylethyl substituted by one or more halogen atoms, or

(e) diphenylethyl; or

(ii) both R_3 and R_4 are benzyl which may be substituted by one or more

(a) benzyloxy groups,

(b) ring substituted benzyloxy groups in which the ring substituents may be one or more halogen atoms, lower alkoxy groups or benzyloxy groups, or

(c) cycloalkylmethoxy groups;

4,537,881
5-NITRO 1,4-DIHYDROPYRIDINES HAVING A POSITIVE INOTROPIC EFFECT

Fred R. Heiker, Wuppertal; Jürgen Stoltefuss, Haan; Gerhard Franckowiak, Wuppertal; Matthias Schramm, Cologne; Günter Thomas, and Rainer Gross, both of Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

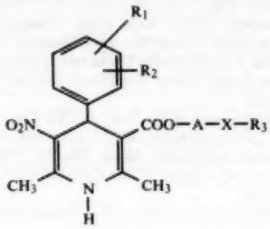
Filed Jul. 3, 1984, Ser. No. 627,596

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1983, 3326384

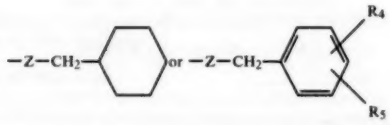
Int. Cl.[3] **A61K** *31/41, 31/395;* **C07D** *405/12*

U.S. Cl. 514—25 **9 Claims**

1. A 1,4-dihydropyridine of the formula



in which R_1 and R_2 each independently is hydrogen, C_1–C_4-alkyl, C_1–C_{12}-alkoxy, C_1–C_4-halogenoalkoxy, halogen, nitro, C_1–C_4-halogenoalkyl, C_1–C_4-halogenoalkylmercapto,



in which

Z is oxygen or sulphur, and

R_4 and R_5 each independently is hydrogen, C_1–C_4-alkyl, C_1–C_6-alkoxy, halogen, C_1–C_4-halogenoalkyl, C_1–C_4-halogenoalkoxy or nitro, or

R_1 and R_2, together with 2 C atoms of the phenyl ring, form the ring

X is oxygen, sulphur or the radical NR_6,

R_6 is a C_1–C_6-alkyl group,

A is a C_2–C_{10}-alkylene group, it being necessary that at least two C atoms are located in the alkylene chain which connects the carbonyloxy group to X, and

R_3 is a monosaccharide or disaccharide moiety or a protected monosaccharide or disaccharide moiety,

or a pharmaceutically acceptable addition salt thereof.

6. A composition for improving the myocardial contractility comprising an amount of a compound or salt according to claim **1** effective therefor plus a diluent.

4,537,882
4-DEMETHOXY-3'-DESAMINO-2'-HALO-ANTHRACYCLINE AND PHARMACEUTICAL COMPOSITION CONTAINING SAME

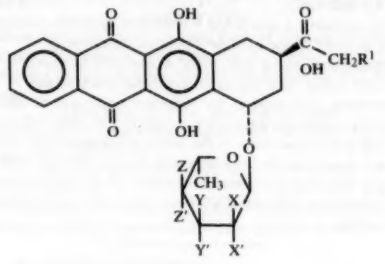
Derek Horton, Columbus, and Waldemar Priebe, Plain City, both of Ohio, assignors to Ohio State University, Columbus, Ohio

Filed May 10, 1984, Ser. No. 609,072

Int. Cl.[3] **A61K** *31/70;* **C07H** *15/24*

U.S. Cl. 514—34 **12 Claims**

7. A pharmaceutical preparation useful for treating the growth of implanted tumors comprising a carrier and a therapeutically effective amount of a compound of the formula



wherein R^1 is hydroxy; one of X and X' is hydrogen and the other is a halogen atom selected from the group consisting of fluorine, chlorine, bromine, and iodine; one of Y and Y' is hydrogen and the other is selected from the group consisting of hydrogen, hydroxy and —OCOR; one of Z and Z' is hydrogen and the other is hydrogen, hydroxy or —OCOR, and R is a lower alkyl group; or a pharmaceutically acceptable acid addition salt thereof.

4,537,883
LYOPHILIZED CYCLOPHOSPHAMIDE

Robert L. Alexander; Robert J. Bequette; Terry T. Kensler, and Joseph A. Scott, all of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Continuation-in-part of Ser. No. 440,906, Nov. 12, 1982, abandoned. This application Mar. 13, 1984, Ser. No. 589,202

Int. Cl.[3] **A61K** *31/66*

U.S. Cl. 514—110 **16 Claims**

1. A hydrated lyophilizate composition with improved stability, superior solubility characteristics and enhanced appearance comprising about 20 parts by weight of cyclophosphamide, taken as the anhydride, about 1¼–2 parts by weight of water and from about 10 to 85 parts by weight of mannitol.

4,537,884
2-TRIFLUOROMETHYLPHENYL (DI)THIOPHOSPHATES, AND THEIR USE FOR PEST CONTROL

Walter Seufert, Ludwigshafen; Juergen Varwig, Heidelberg; Wolfgang Seppelt, Bobenheim-Roxheim, and Heinrich Adolphi, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

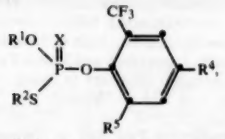
Filed Jan. 11, 1983, Ser. No. 457,184

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1982, 3201227

Int. Cl.[3] **A01N** *57/14;* **C07F** *9/165*

U.S. Cl. 514—127 **5 Claims**

1. A 2-trifluoromethylphenyl (di)thiophosphate of the formula



(I)

where R^1 is alkyl of 1 to 3 carbon atoms, R^2 is alkyl of 1 to 5 carbon atoms, alkoxyalkyl or alkylthioalkyl of 2 to 8 carbon atoms or cycloalkyl of 3 to 6 carbon atoms, R^4 and R^5 independently of one another are each hydrogen, halogen or alkyl of 1 to 4 carbon atoms, and X is oxygen or sulfur.

4. A process for combating pests, wherein an effective amount of a 2-trifluoromethylphenyl (di)thiophosphate of the formula I as defined in claim 1 is allowed to act on pests and/or their habitat.

4,537,885

CERTAIN BENZAZOCINONE AND BENZAZONINONE DERIVATIVES

Jeffrey W. H. Watthey, Chappaqua, N.Y., assignor to Ciba Geigy Corporation, Ardsley, N.Y.

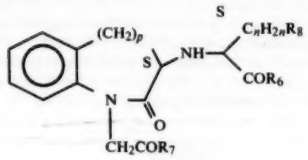
Continuation-in-part of Ser. No. 465,696, Feb. 10, 1983, Pat. No. 4,470,988. This application Feb. 9, 1984, Ser. No. 578,454

The portion of the term of this patent subsequent to Sep. 11, 2001, has been disclaimed.

Int. Cl.[3] **A61K** *31/395;* **C07D** *225/06*

U.S. Cl. 514—183 **11 Claims**

1. A compound of the formula



(IC)

wherein

S represents the chirality,

n represents an integer from 1 to 4; p is the integer 3 or 4;

R_8 is hydrogen, amino, benzyloxycarbonylamino, phenyl unsubstituted or monosubstituted by lower alkyl, lower alkoxy, lower alkanoyloxy, halogen, hydroxy, or trifluoromethyl;

R_6 and R_7 independently represent hydroxy, lower alkoxy of up to 4 carbon atoms, benzyloxy or amino; or

a pharmaceutically acceptable salt thereof.

9. A pharmaceutical composition suitable for oral or parenteral administration to mammals for the treatment or prevention of diseases responsive to inhibition of angiotensin-converting enzyme comprising an effective amount of a compound of claim 1 in combination with one or more pharmaceutically acceptable carriers.

4,537,886

β-LACTAM ANTIBACTERIAL AGENTS AND COMPOSITIONS CONTAINING THEM

Andrew W. Taylor, Reigate, and Richard T. Cook, Redhill, both of England, assignors to Beecham Group p.l.c., England

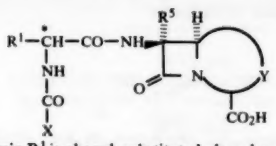
Filed Mar. 29, 1983, Ser. No. 479,953

Claims priority, application United Kingdom, Mar. 31, 1982, 8209426

Int. Cl.[3] **A61K** *31/43, 31/545;* **C07D** *499/54, 501/22*

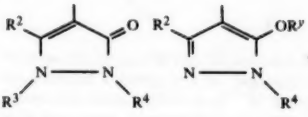
U.S. Cl. 514—193 **24 Claims**

1. A compound of formula (I) or a pharmaceutically acceptable salt or in-vivo hydrolysable ester thereof:

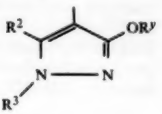


(I)

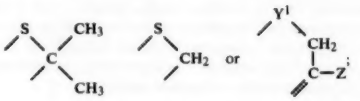
wherein R^1 is phenyl, substituted phenyl or a 5- or 6-membered heterocyclic ring containing up to three heteroatoms selected from the group consisting of oxygen, sulphur and nitrogen, optionally substituted with hydroxy, amino, halogen or alkoxy of 1 to 6 carbon atoms; X represents



or

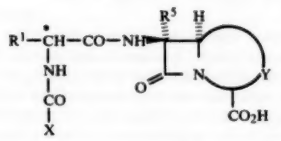


wherein R^y is methyl or acetyl; R^2 and R^3 may be the same or different and each is hydrogen, an aryl group, a heterocyclyl group or an alkyl group of 1 to 6 carbon atoms optionally substituted by an aryl group or a heterocyclyl group; and R^4 is hydrogen, an alkylcarbonyl group of 1 to 6 carbon atoms in the alkyl moiety, an aryl group, a heterocyclyl group, an alkyl group of 1 to 6 carbon atoms optionally substituted by an aryl group or a heterocyclyl group; R^5 represents hydrogen, methoxy or —NHCHO; and Y is:



wherein Y^1 is oxygen, sulphur or $—CH_2—$ and Z represents hydrogen, halogen, alkoxy of 1 to 4 carbon atoms, $—CH_2Q$ or —CH=CH—Q wherein Q represents hydrogen, halogen, hydroxy, mercapto, cyano, carboxy, carbamoyloxy carboxylic ester, alkyloxy of 1 to 4 carbon atoms, acyloxy, aryl, a heterocyclyl group bonded via carbon, a heterocyclylthio group or a nitrogen containing heterocyclic group bonded via nitrogen and the carbon atom marked * is asymmetric.

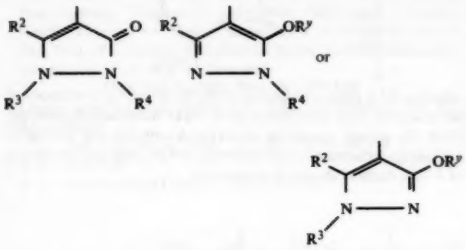
7. A pharmaceutical composition useful for treating bacterial infections in humans and animals which comprises an antibacterially effective amount of a compound of the formula (I) or a pharmaceutically acceptable salt or in-vivo hydrolysable ester thereof:



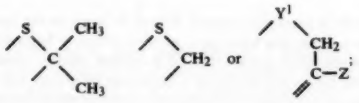
(I)

wherein R^1 is phenyl, substituted phenyl or a 5- or 6-membered heterocyclic ring containing up to three heteroatoms selected from the group consisting of oxygen, sulphur and nitrogen,

optionally substituted with hydroxy, amino, halogen or alkoxy of 1 to 6 carbon atoms; X represents



wherein R^y is methyl or acetyl; R^2 and R^3 may be the same or different and each is hydrogen, an aryl group, a heterocyclyl group or an alkyl group of 1 to 6 carbon atoms optionally substituted by an aryl group or a heterocyclyl group; and R^4 is hydrogen, an alkylcarbonyl group of 1 to 6 carbon atoms in the alkyl moiety, an aryl group, a heterocyclyl group, an alkyl group of 1 to 6 carbon atoms optionally substituted by an aryl group or a heterocyclyl group; R^5 represents hydrogen, methoxy or —NHCHO; and Y is:



wherein Y^1 is oxygen, sulphur or $—CH_2—$ and Z represents hydrogen, halogen, alkoxy of 1 to 4 carbon atoms, $—CH_2Q$ or —CH=CH—Q wherein Q represents hydrogen, halogen, hydroxy, mercapto, cyano, carboxy, carbamoyloxy carboxylic ester, alkyloxy of 1 to 4 carbon atoms, acyloxy, aryl, a heterocyclyl group bonded via carbon, a heterocyclylthio group or a nitrogen containing heterocyclic group bonded via nitrogen and the carbon atom marked * is asymmetric, in combination with a pharmaceutically acceptable carrier.

4,537,887

PHARMACEUTICAL FORMULATION

David J. Rooke, Horsham, and Barry W. Burnstead, Littlehampton, both of England, assignors to Beecham Group Limited, England

Continuation of Ser. No. 478,151, Mar. 23, 1983, which is a continuation of Ser. No. 303,786, Sep. 21, 1981, abandoned. This application Oct. 5, 1983, Ser. No. 539,099

Claims priority, application United Kingdom, Sep. 27, 1980, 8031298

Int. Cl.[3] **A61K** *31/43, 31/42, 47/00*

U.S. Cl. 514—197 **12 Claims**

1. A pharmaceutical composition in unit does tablet form suitable for oral administration to humans and animals which comprises amoxycillin trihydrate equivalent to 20 mg to 1500 mg of amoxycillin, potassium clavulanate equivalent to 20 mg to 500 mg of clavulanic acid, the weight ratio of amoxycillin to clavulanic acid being in the range of from 12:1 to 1:1, an effective amount of a colloidal silica having an average particle size of 8 μm and a BET specific surface area of about 750 m^2/g incorporated within each tablet as a desiccant, and a pharmaceutically acceptable carrier suitable for tablets.

4,537,888

SUBSTITUTED BENZOXAZINE DERIVATIVES AND FUNGICIDAL USE

Klaus Naumann; Hans Scheinpflug, both of Leverkusen; Hans-Jürgen Rosslenbroich, Langenfeld, and Volker Paul, Soest, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

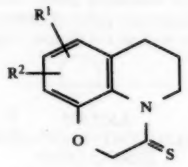
Filed Aug. 29, 1983, Ser. No. 527,442

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1982, 3234529

Int. Cl.[3] **A01N** *43/90;* **C07D** *498/04*

U.S. Cl. 514—228 **16 Claims**

1. A substituted benzoxazine derivative of the formula



in which

R^1 and R^2 each independently is hydrogen, alkyl, alkoxy, alkylthio, halogenoalkyl, alkanoyl, aroyl, halogen, cyano, nitro, nitroso, amino or the sulphonic acid grouping.

2. A compound selected from the group consisting of 5-bromo-4,5-trimethylene-1,4-benzoxazin-3-one, 6-chloro-4,5-trimethylene-1,4-benzoxazin-3-one, 6-iodo-4,5-trimethylene-1,4-benzoxazin-3-one, and 7-cyano-4,5-trimethylene-1,4-benzoxazin-3-one.

14. A method of combatting fungi which comprises administering to such fungi or to a fungus habitat a fungicidally effective amount of a compound according to claim 1.

16. A method of combatting fungi which comprises administering to such fungi or to a fungus habitat a fungicidally effective amount of a compound according to claim 2.

4,537,889

INOTROPIC AGENTS

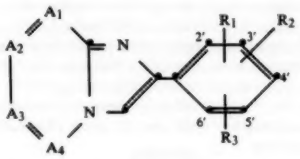
Wayne A. Spitzer, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 453,565, Dec. 27, 1982, abandoned. This application May 3, 1984, Ser. No. 606,806

Int. Cl.[3] **C07D** *487/04;* **A61K** *31/53*

U.S. Cl. 514—243 **10 Claims**

1. Compounds of the formula



I

and their pharmaceutically acceptable salts, wherein two of A_1, A_2, A_3, and A_4 are N, and the remaining A_1, A_2, A_3, and A_4 are CH, and each of R_1, R_2, and R_3 is independently hydrogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, allyloxy, benzyloxy, (C_1–C_4 alkyl)thio, (C_1–C_4 alkyl)sulfinyl, (C_1–C_4 alkyl)sulfonyl, hydroxy, halo, cyano, amino, mono- or di-(C_1–C_4 alkyl)amino, trifluoromethyl, or Z-Q-substituted C_1–C_4 alkoxy, wherein Q is oxygen, sulfur, sulfinyl, sulfonyl, or a bond, and Z is C_1–C_4 alkyl, phenyl or phenyl substituted with halo C_1–C_4 alkyl, C_1–C_4 alkoxy, hydroxy, nitro, amino, C_1–C_4 alkylthio, C_1–C_4 alkylsulfinyl, or C_1–C_4 alkylsulfonyl, with the proviso that R_1, R_2, and R_3 may not all be hydrogen at the same time.

9. A method of producing a positive inotropic effect or

causing vasodilation in a warm-blooded mammal, which comprises the administration to such mammal an effective amount of a compound of claim 1.

4,537,890

2-(3,5-SUBSTITUTED-2-PYRIDYLALKYLAMINO)-5-OXOPYRIDYLMETHYL-4-PYRIMIDONES USEFUL AS HISTAMINE H_1-ANTAGONISTS

George S. Sach, Welwyn, England, assignor to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

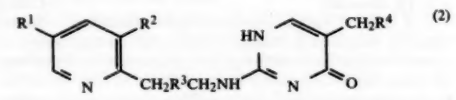
Filed Nov. 23, 1983, Ser. No. 554,497

Claims priority, application United Kingdom, Dec. 3, 1982, 8234513; Aug. 19, 1983, 8322346

Int. Cl.[3] **A61K** *31/505;* **C07D** *239/02, 401/00*

U.S. Cl. 514—272 **20 Claims**

1. A compound of formula (2)



(2)

or a pharmaceutically acceptable salt thereof; where

R^1 is halogen, nitro, amino, C_{1-4} alkylamino, C_{1-4} alkanoylamino or C_{1-4} alkyl;

R^2 is halogen, nitro, amino, C_{1-4} alkylamino, C_{1-4} alkanoylamino, C_{1-4} alkyl or C_{3-4} alkoxy; provided that R^1 and R^2 are not both selected from amino, C_{1-4} alkylamino, C_{1-4} alkanoylamino and nitro;

R^3 is a C_{1-3} alkylene group; and

R^4 is a pyridone group in which the nitrogen atom is optionally substituted with a group R^5, where R^5 is C_{1-4} alkyl, hydroxy C_{1-4} alkyl, C_{1-4} alkoxy C_{1-4} alkyl, or phenyl-C_{1-4} alkyl optionally substituted by one hydroxy, halogen, C_{1-4} alkoxy or C_{1-4} alkyl; or is a 2- or 4- C_{1-4} alkoxy pyridyl group.

20. A method of blocking histamine H_1-receptors which comprises administering to a subject an effective amount to block said receptors of a compound according to claim 1.

4,537,891

2-(3,5-SUBSTITUTED-2-PYRIDYLALKYLAMINO)-5-BENZYL-4-PYRIMIDONES

George S. Sach, Welwyn, England, assignor to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

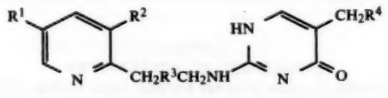
Filed Sep. 29, 1983, Ser. No. 537,457

Claims priority, application United Kingdom, Oct. 1, 1982, 8228029; Dec. 2, 1982, 8234381; Jul. 23, 1983, 8319875

Int. Cl.[3] **A61K** *31/505;* **C07D** *239/02*

U.S. Cl. 514—272 **17 Claims**

1. A compound of formula (2):



or a pharmaceutically acceptable salt thereof; where

R^1 is halogen, nitro, amino, C_{1-4} alkylamino, C_{1-4} alkanoylamino or C_{1-4} alkyl;

R^2 is halogen, nitro, amino, C_{1-4} alkylamino, C_{1-4} alkanoylamino, C_{1-4} alkyl or C_{3-4} alkoxy; provided that R^1 and R^2 are not both selected from amino, C_{1-4} alkylamino, C_{1-4} alkanoylamino and nitro;

R^3 is a C_{1-3} alkylene group; and

R^4 is phenyl optionally bearing one or two substituents which are the same or different and are halogen, hydroxy, C_{1-4} alkyl or C_{1-4} alkoxy or a methylenedioxy group.

17. A method of blocking histamine H_1-receptors which comprises administering to a subject an effective amount to block said receptors of a compound according to claim 1.

4,537,892

SPIRO-TRICYCLICAROMATIC SUCCINIMIDE DERIVATIVES AS INHIBITORS OF ALDOSE REDUCTASE

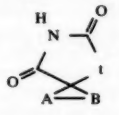
Billie M. York, Jr., Fort Worth, Tex., assignor to Alcon Laboratories, Inc., Fort Worth, Tex.

Filed Sep. 14, 1983, Ser. No. 532,168

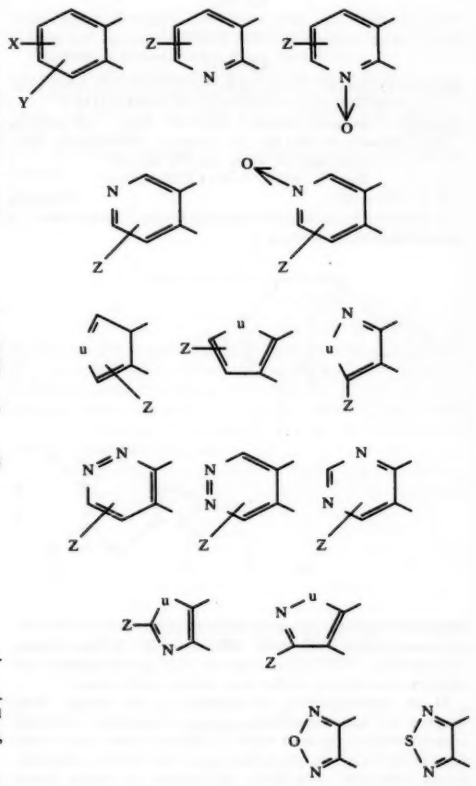
Int. Cl.[3] **A61K** *31/415;* **C07D** *487/10, 487/20*

U.S. Cl. 514—278 **72 Claims**

1. A compound of the formula:



and the pharmaceutically acceptable salts thereof, wherein A and B are aromatic rings connected through two adjacent positions to a central five-membered ring, and are independently selected from the group consisting of:



U is selected from the group consisting of O, S, and NR^1;

X is selected from the group consisting of H, F, lower alkyl sulfide, and lower alkylsulfinyl;

Y is selected from H, —OH, —$OCOR^3$, F, Cl, lower alkyl, lower alkoxy, lower alkylsulfide, lower alkylsulfinyl, lower alkylsulfonyl, $-CF_3$, $-S-CF_3$, $-SO_2CF_3$, $CO-N(R^1)-R^2$, lower alkyl alcohol, lower alkyl ether, nitro, lower alkyl sulfide lower alkyl, lower alkylamine, lower alkyl esters, —COOH and lower alkyl ester, lower alkyl carboxylic acids and lower alkyl esters, and cycloalkyl of six or less carbons, provided that when both of Rings A and B are phenyl, and one of X or Y is H or F, the other of X or Y must be other than H or F; and

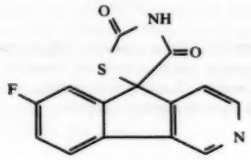
R^1 and R^2 are selected from the group consisting of hydrogen and lower alkyl;

R^3 is lower alkyl;

Z is selected from the group consisting of hydrogen, lower alkyl, and halogen;

t is selected from the group consisting of CHR^1, NH, O, and S.

18. A spiro-tricyclic compound according to claim **1** of the formula:



4,537,893

OCTAHYDROTHIAZOLO[4,5-g]QUINOLINES AND USE AS PROLACTIN SECRETION INHIBITORS

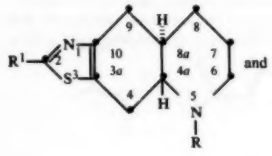
Robert D. Titus, and Edmund C. Kornfeld, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 27, 1984, Ser. No. 604,687

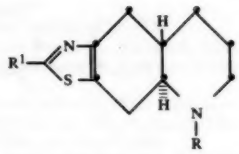
Int. Cl.[3] **A61K** *31/47;* **C07D** *513/02*

U.S. Cl. 514—293 **53 Claims**

1. A trans-(±)-racemate containing trans-(−) and trans-(+) enantiomers of the formula



and



wherein R is H, C_{1-3} straight-chain alkyl or allyl and R^1 is H, halogen, methyl, OH, NH_2, NHC_{1-3} alkyl, $N(C_{1-3}$ alkyl$)_2$, 1-pyrrolidinyl, $NHCOC_{1-3}$ alkyl or NHC_{1-2} alkylphenyl and pharmaceutically-acceptable acid addition salts thereof.

51. A pharmaceutical formulation in unit dosage form adapted for administration to counter depression, alleviate anxiety, reduce elevated blood pressure, lower excessively high prolactin levels, treat Parkinson's Syndrome, potentiate sexual behaviour, treat sexual dysfunction or restore sexual potency comprising per dosage unit, a standard pharmaceutical excipient plus an amount of a drug according to claim **6** to inhibit the secretion of prolactin, to relieve anxiety, to counter depression, to lower blood pressure of hypertensives, to treat Parkinson's Syndrome, to potentiate sexual behaviour, to treat sexual dysfunction or to restore sexual potency.

4,537,894

METHODS OF USING COMPOSITIONS HAVING ANTITHROMBOTIC AND ANTI-BLOOD-PLATELET-AGGREGATING ACTIVITY

Jean Blanchard, and Edouard Panak, both of Toulouse, France, assignors to Sanofi, S.A., Paris, France

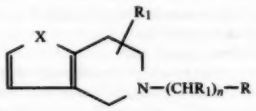
Continuation of Ser. No. 347,700, Feb. 11, 1982, abandoned, which is a continuation of Ser. No. 108,651, Dec. 31, 1979, abandoned, which is a continuation-in-part of Ser. No. 917,374, Jun. 20, 1978, Pat. No. 4,210,649. This application May 16, 1983, Ser. No. 494,133

Claims priority, application United Kingdom, Dec. 29, 1978, 50359/78

Int. Cl.[3] **A61K** *31/415, 31/435*

U.S. Cl. 514—301 **5 Claims**

1. A method for the prevention or treatment of a disease inducing pathological change in blood-platelet-aggregation in a patient subject to or suffering from such a disease, comprising administering to said patient in an amount effective for prevention or treatment of said disease, sulfinpyrazone and a pyridine derivative, for causing antithrombotic and anti-blood-platelet-aggregation activity, the blood platelet aggregation being A.D.P. induced, said pyridine derivative being selected from the group consisting of compounds having the formula:



(I)

in which

X represents oxygen or sulfur;

R is selected from the group consisting of unsubstituted phenyl and benzoyl, phenyl and benzoyl having at least one substituent selected from the group consisting of halogen, straight or branched-chain lower alkyl, straight- or branched-chain lower alkoxy, nitro, amino, sulfonylamino, carboxy, lower alkoxycarbonyl, cyano, phenyl, hydroxy alkyl, methylene-dioxy and ethylene-dioxy, and an alpha-naphthyl group or a thienyl group;

R_1 represents a hydrogen or halogen atom or a hydroxy group, a straight- or branched-chain lower alkyl group, a straight- or branched-chain lower alkoxy group, or a phenyl group;

R′ represents a lower alkyl group; and

n is an integer from 1 to 15; and the symbols R_1 may have different meanings in each radical CHR_1 when n is greater than 1;

and the pharmaceutically acceptable acid addition salts and quaternary ammonium derivatives of said compounds.

4,537,895

ISOQUINOLINE DERIVATIVES

Gyula Deák; Erzsébet Zára née Kaczián; Lajos György; Márton Fekete; Margit Dóda; András Seregi, all of Budapest; Béla Kanyicska, Kerepestarcsa; Erzsébet Tóth née Pécsi, Budapest; Mária Horváth née Gaál, Budapest; Sándor Mányai, Budapest; Frigyes Görgényi, Budapest, and Györgyi Vászovics née Reichmann, Budapest, all of Hungary, assignors to EGYT Gyógyszervegyészeti Gyár, Budapest, Hungary

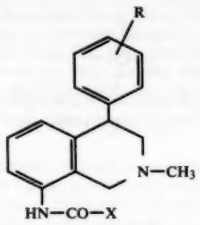
Filed Jun. 3, 1983, Ser. No. 500,969

Claims priority, application Hungary, Apr. 4, 1982, 1797; Apr. 4, 1982, 1798; Apr. 4, 1982, 1799

Int. Cl.[3] **A61K** *31/47;* **C07D** *217/04*

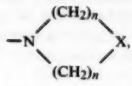
U.S. Cl. 514—307 **9 Claims**

1. 4-aryl-2-methyl-1,2,3,4-tetrahydro-isoquinoline derivatives of the formula I



I

is a ring system



wherein

R stands for hydrogen, lower alkyl or halogen and

X represents a group of the formula $-(CH_2)_n-NR^1R^2$, $-N-H-R^3$ or $-OR^4$, in which

R^1 and R^2 may be the same or different and stand for for hydrogen or lower alkyl or R^1 and R^2 together with the adjacent nitrogen atom to which they are attached, form a 5- or 6-membered saturated pyrrolidino, piperidino, morpholino, thiomorpholino, piperazino, N-alkylpiperazino or N-benzyl piperazino ring;

n is the integer 1, 2, 3 or 4;

R^3 stands for lower alkyl, phenyl or phenyl substituted by halogen or lower alkyl and

R^4 is lower alkyl, halogeno lower alkyl, or phenyl lower alkyl

and pharmaceutically acceptable acid addition salts thereof.

9. Pharmaceutical compositions having advantageous central nervous system effects as active ingredient an effective amount of at least one compound of the formula I as defined in claim **1** or a pharmaceutically acceptable acid addition salt thereof in admixture with suitable inert non-toxical, pharmaceutical carriers and/or excipients.

wherein n=2

or 3 and X is a single-bond, CH_2,CH—CH_3, CH—CH_2H_5, CH—CH_3H_7, O, NH or N—CH_3, in free base form or in form of pharmaceutically acceptable acid addition salt thereof.

11. Pharmaceutical composition for treatment or prevention of thrombosis containing one or more compounds according to claim **1** in an amount effective for said treatment or said prevention and a carrier.

4,537,896

THROMBIN INHIBITING ARYLSULFONYL GUANIDINOPHENYLALANINE AMIDES

Carl G. Claeson, Lidingö , and Stig I. Gustavsson, Mölndal, both of Sweden, assignors to KabiVitrum AB, Stockholm, Sweden

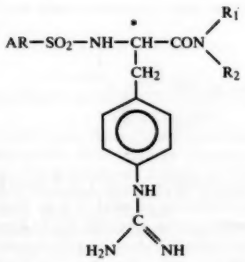
Filed Jun. 14, 1983, Ser. No. 504,338

Claims priority, application Sweden, Jun. 23, 1982, 8203887

Int. Cl.[3] **A61K** *31/445, 31/16;* **C07D** *211/16;* **C07C** *147/13*

U.S. Cl. 514—330 **14 Claims**

1. N^{α}-arylsulfonyl-p-guanidinophenylalanine amides of the formula



I

wherein Ar is ortho-, meta- or para-tolyl, naphthyl-1, naphthyl-2 or 5-dimethylamino-1-naphthyl; R_1 and R_2 are an alkyl group having 1–5 carbon atoms or

---

4,537,897

3-(1,2-PROPADIENYL)-CYCLOPROPANE-CARBOXYLATES

Jean Tessier, Vincennes; Jean-Pierre Demoute, Montreuil-Sous-Bois, and Joseph Cadiergue, Aulnay-Sous-Bois, all of France, assignors to Roussel Uclaf, Paris, France

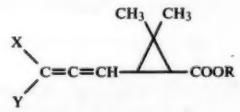
Filed Sep. 15, 1983, Ser. No. 532,825

Claims priority, application France, Sep. 29, 1982, 82 16372

Int. Cl.[3] **A01N** *53/00;* **C07D** *213/68;* **C07C** *69/743, 69/747*

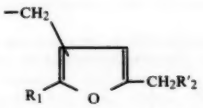
U.S. Cl. 514—351 **28 Claims**

1. A 3-(1,2-propadienyl)-cyclopropane-carboxylate of the formula



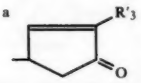
I

wherein R is selected from the group consisting of (1) alkyl of 1 to 18 carbon atoms, (2) benzyl optionally substituted with at least one member of the group consisting of alkyl of 1 to 4 carbon atoms, alkenyl of 2 to 6 carbon atoms, alkenyloxy of 2 to 6 carbon atoms, alkadienyl of 4 to 8 carbon atoms, methylenedioxy and halogens,



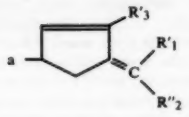
(3)

wherein R_1 is selected from the group consisting of hydrogen and methyl and R_2' is selected from the group consisting of —C≡CH and 5-benzyl-3-furyl-methyl,

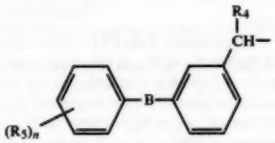


(4)

wherein a is selected from the group consisting of hydrogen and methyl and R_3' is an aliphatic group of 2 to 6 carbon atoms containing at least one carbon-carbon unsaturation,

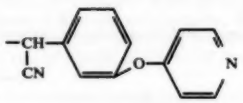

(5)

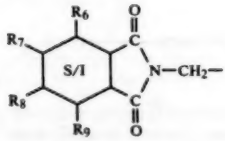
wherein a and R_3' have the above definition and R_1' and R_2'' are individually selected from the group consisting of hydrogen, halogen, alkyl of 1 to 6 carbon atoms, phenyl, cyano and alkoxy carbonyl of 2 to 5 carbon atoms,


(6)

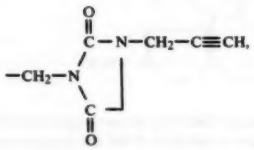
wherein B is selected from the group consisting of $-CH_2-$,

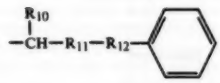
—O— and —S—, R_4 is selected from the group consisting of hydrogen, C≡N, $-CH_3$, $-CONH_2$, $-CSNH_2$ and $-C{\equiv}CH$, n is an integer from 0, 1 or 2 and R_5 is selected from the group consisting of halogen and $-CH_3$


(7)


(8)

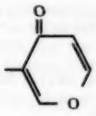
wherein R_6, R_7, R_8 and R_9 are selected from the group consisting of hydrogen, chlorine and methyl and S/I symbolizes an aromatic ring or dihydro, tetrahydro or hexahydro ring, (9) (succinimido or maleimido) $-CH_2-$

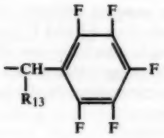

(10)


(11)

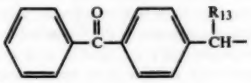
wherein R_{10} is selected from the group consisting of hydrogen and —CN, R_{12} is selected from the group consisting of $-CH_2-$ and —O— and R_{11} is selected from the group consisting of thiazolyl and thiadiazolyl with the bond to

being in any one of the positions, R_{12} being bonded to R_{11} by the carbon atom included between a sulfur atom and a nitrogen atom,

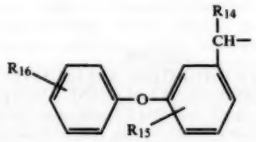

(12)


(13)

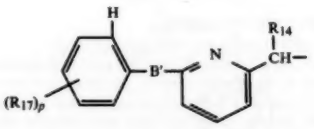
wherein R_{13} is selected from the group consisting of hydrogen and —CN,


(14)

wherein R_{13} has the above definition


(15)

wherein R_{14} is selected from the group consisting of hydrogen, methyl, ethynyl and —CN and R_{15} and R_{16} are individually selected from the group consisting of hydrogen, bromine and fluorine and


(16)

wherein R_{14} has the above definition, p is 0, 1 or 2, each R_{17} is selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, alkylsulfonyl of 1 to 4 carbon atoms, $-CF_3$, 3,4-methylenedioxy, chlorine, bromine and fluorine, B' is selected from the group consisting of —O— and —S—, X and Y are both hydrogen or individually halogen or X is hydrogen or halogen and Y is alkyl of 1 to 18 carbon atoms or halogen.

4,537,898

LIQUID FORMULATIONS OF DIHYDROPYRIDINES

Dieter Hoff, Leverkusen, and Klaus-Dieter Rämsch, Wuppertal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 13, 1984, Ser. No. 579,833

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1983, 3307422

Int. Cl.[3] A61K *31/455*

U.S. Cl. 514—356 5 Claims

1. A liquid formulation of a dihydropyridine comprising, by weight, about 1 to 5 parts of a dihydropyridine selected from the group consisting of nisoldipine, nimodipine and 3-methyl 5-trifluoroethyl diester of 4-(2-chlorophenyl)-2,6-dimethyl-1,4-dihydropyridine-3,5-dicarboxylic acid, 30 to 50 parts of weight of a solubilizing agent comprising glycerol polyethylene glycol oxystearate oxyethylated with about 35, 45 or 60 mols of ethylene oxide and 70 to 50 parts of a diluent consisting essentially of water, ethanol, glycerol, 1,2-propylene glycol, polyethylene glycol 200, polyethylene glycol 400 or polyethylene glycol 600.

4,537,899

ANTIVIRAL ACYLATED 1,2,4-TRIAZOLE DERIVATIVES

István Horváth; Tibor Láng; László Pongo; József Reiter; Tamás Somorai; Géza Szilágyi, and Lajos Toldy, all of Budapest, Hungary, assignors to BIOGAL Gyógyszergyár, Debrecen, Hungary

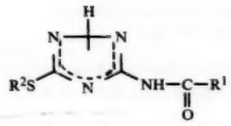
Filed Aug. 25, 1983, Ser. No. 526,694

Claims priority, application Hungary, Sep. 1, 1982, 2797/82

Int. Cl.[3] A01N *43/64;* A61K *31/41;* C07D *249/14*

U.S. Cl. 514—384 6 Claims

1. Acylated 1,2,4-triazole derivatives of formula I



I

wherein

R^1 represents an unsubstituted phenyl group or a phenyl group substituted by one or more halogen atoms, lower alkyl, lower alkoxy, acyloxy, carbomethoxy hydroxy, amino, azido, nitro, trifluoromethyl, lower alkylthio, lower alkylsulfinyl, or lower alkylsulfonyl group, and

R^2 stands for a C_{1-6} alkyl group or a phenyl lower alkyl group which is either unsubstituted or substituted in the aromatic nucleus by a halogen atom or a nitro group,

and their pharmaceutically acceptable salts.

6. Antiviral pharmaceutical compositions containing as active ingredient an effective amount of one or more compounds of formula I—wherein R^1 and R^2 have a meaning as claimed in claim 1—or a pharmaceutically acceptable salt thereof, and a conventional inert, non-toxic, solid or liquid carrier and/or additive.

4,537,900

CIMETIDINE Z, A NEW CRYSTAL MODIFICATION OF CIMETIDINE

János Kreidl; Maria Farkas née Kirják; Kalmán Harsányi; Belá Benke; András Radó; György Domany; Béla Hegedüs; Éva Csongor; Ida Deutsch née Juhász, and Hajnalka Pethö, all of Budapest, Hungary, assignors to Richter Gedeon Vegyészeti Gyar R.T., Budapest, Hungary

Continuation of Ser. No. 423,074, Sep. 24, 1982, abandoned. This application Jul. 20, 1984, Ser. No. 632,311

Claims priority, application Hungary, Sep. 25, 1981, 2767/81

Int. Cl.[3] A61K *31/415;* C07D *233/64*

U.S. Cl. 514—400 3 Claims

3. A composition for producing the histamine H-2 receptor antagonist modification A which comprises an effective amount of the crystal modification Z of N-methyl-N'-2-[(5-methylimidazol-4-yl)-methylthio]-ethyl-N''-cyanoguanidine in association with a pharmaceutically acceptable carrier and/or excipient.

4,537,901

INSECTICIDAL CARBAMATES

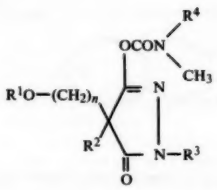
Arno Lange, Bad Durkheim; Franz Merger, Frankenthal; Peter Hettinger, Edingen-Neckarhausen, and Heinrich Adolphi, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 14, 1984, Ser. No. 620,564

Int. Cl.[3] A01N *43/56;* C07D *231/08, 491/107*

U.S. Cl. 514—404 5 Claims

1. A carbamate of the formula



(I)

where either R^1 is straight-chain or branched alkyl of not more than 4 carbon atoms and R^2 is straight-chain or branched alkyl of not more than 6 carbon atoms, or R^1 and R^2, together with the molecular moiety which they include, form a 5-membered, 6-membered or 7-membered saturated heterocyclic ring, R^3 is straight-chain or branched alkyl of not more than 6 carbon atoms or cycloalkyl of 3 to 6 carbon atoms, R^4 is methyl or methoxy, and n is 1 or 2.

5. A method for combatting insects and acarids, wherein an effective amount of a carbamate of the formula I as defined in claim 1 is allowed to act on the insects or acarids or their habitat.

4,537,902

4-SUBSTITUTED-3-HYDROXY-3-PYRROLINE-2,5-DIONE INHIBITORS OF GLYCOLIC ACID OXIDASE

Edward J. Cragoe, Jr., Lansdale; Clarence S. Rooney, Worcester, both of Pa., and Haydn W. R. Williams, Dollard des Ormeaux, Canada, assignors to Merck & Co., Inc. and Merck Sharp & Dohme (I.A.) Corp., both of Rahway, N.J.

Filed Jun. 11, 1979, Ser. No. 47,412

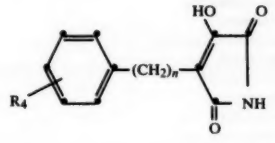
Int. Cl.[3] C07D *403/02, 207/40;* A61K *31/40*

U.S. Cl. 514—422 4 Claims

1. 3-Hydroxy-4-(cyclohexyl)phenyl-3-pyrroline-2,5-dione.

2. 3-Hydroxy-4-[4-(2'-phenyl-1-indolyl)phenyl]-3-pyrroline-2,5-dione.

3. A method of treating persons afflicted with calcium oxalate kidney or bladder stones or preventing the formation of calcium oxalate bladder or kidney stones which comprises administering to such a patient an effective amount of a compound having the structure



wherein

n is 0 to 3; and

R_4 is alkyl having 4 to 12 carbon atoms, cycloalkyl contain-

ing from 5 to 7 carbon atoms, iodo 1,2,3,4-tetrhydro-1 naphthyl, 4-(2'-phenyl-1-indolyl)phenyl or a pharmaceutically acceptable salt thereof.

4,537,903

SUBSTITUTED CINNAMYL-2,3-DIHYDROBENZOFURAN AND ANALOGS USEFUL AS ANTI-INFLAMMATORY AGENTS

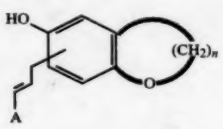
Michael N. Chang, Westfield; Milton L. Hammond, Edison; Norman P. Jensen, New Providence, all of N.J.; John McDonald, Indianapolis, Ind., and Robert A. Zambias, Hoboken, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 12, 1983, Ser. No. 541,200

Int. Cl.[3] **A61K** *31/34, 31/35;* **C07D** *307/79, 311/58*

U.S. Cl. 514—456 **12 Claims**

1. A compound of formula (I) or (II)



(I)

or a pharmaceutically acceptable salt thereof wherein

n is 2 or 3

A is

(a) phenyl substituted with $(R^1)_q$ wherein when q is 2 to 5 R^1 can be the same or different from each other and R^1 is

(1) hydrogen;
(2) halo;
(3) loweralykoxy;
(4) lower alkylthio;
(5) lower alkyl sulfinyl;
(6) lower alkyl sulfonyl;
(7) unsubstituted or substituted phenyl loweralkoxy;
(8) loweralkyl;
(9) loweralkenyl;
(10) lower alkanoyl;
(11) halololoweralkyl;
(12) —COOH;
(13) aryl;
(14) aryloxy;
(15) cyano;
(16) hydroxyloweralkyl;
(17) halo loweralkanoyl;
(18) heteroaryl as defined below; or
(19) loweralkanoyloxy;

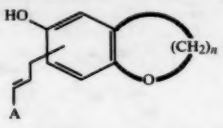
q is 0 to 5;

(b) unsubstituted or substituted heteroaryl selected from a group consisting of:

(1) thienyl;
(2) benzothienyl;
(3) furyl;
(4) benzofuryl;
(5) pyrryl;
(6) indolyl;
(7) thiazolyl;
(8) benzothiazolyl;
(9) thiadiazolyl;
(10) benzothiadiazolyl;
(11) quinolyl;
(12) isoquinolyl;
(13) pyridyl;
(14) pyrazinyl;
(15) tetrazolyl; or
(16) triazolyl,

the heteroaryl above being substituted with one or more of R^1.

9. A method of treating or decreasing topical inflammation comprising the administration to a mammalian species in need of such treatment a therapeutically effective amount of a compound of formula I or II



(I)

or a pharmaceutically acceptable salt thereof wherein

n is 2 or 3

A is

(a) phenyl substituted with $(R^1)_q$ wherein when q is 2 to 5 R^1 can be the same or different from each other and R^1 is

(1) hydrogen;
(2) halo;
(3) loweralkoxy;
(4) lower alkylthio;
(5) lower alkyl sulfinyl;
(6) lower alkyl sulfonyl;
(7) unsubstituted or substituted phenyl loweralkoxy;
(8) loweralkyl;
(9) loweralkenyl;
(10) lower alkanoyl;
(11) halololoweralkyl;
(12) —COOH;
(13) aryl;
(14) aryloxy;
(15) cyano;
(16) hydroxyloweralkyl;
(17) halo loweralkanoyl;
(18) heteroaryl as defined below; or
(19) loweralkanoyloxy;

q is 0 to 5;

(b) unsubstituted or substituted heteroaryl, selected from a group consisting of:

(1) thienyl;
(2) benzothienyl;
(3) furyl;
(4) benzofuryl;
(5) pyrryl;
(6) indolyl;
(7) thiazolyl;
(8) benzothiazolyl;
(9) thiadiazolyl;
(10) benzothiadiazolyl;
(11) quinolyl;
(12) isoquinolyl;
(13) pyridyl;
(14) pyrazinyl;
(15) tetrazolyl; or
(16) triazolyl,

the heteroaryl above being substituted with one or more of R^1.

4,537,904

COMPOSITIONS OF 7-OXABICYCLOHEPTANE AND 7-OXABICYCLOHEPTENE COMPOUNDS AND A METHOD FOR THEIR USE IN INHIBITING BRONCHOCONSTRICTION

David L. Snitman, Boulder, Colo.; Martin F. Haslanger, Lambertville, and Peter W. Sprague, Pennington, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

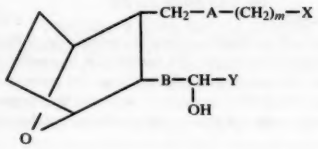
Division of Ser. No. 378,547, May 17, 1982, which is a continuation-in-part of Ser. No. 319,511, Nov. 9, 1981, abandoned. This application Jul. 28, 1983, Ser. No. 518,227

Int. Cl.[3] **A61K** *31/34, 31/41*

U.S. Cl. 514—469 **20 Claims**

1. A method of inhibiting bronchoconstriction, which comprises administering to the circulatory system of a mammalian

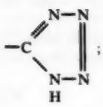
host an effective amount of a compound having the structural formula



and including all stereoisomers thereof; wherein

A and B may be the same or different and A is CH=CH or $(CH_2)_2$, B is CH=CH, C≡C, or $(CH_2)_2$; m is 1 to 8;

X is OH;



CO_2R^1 wherein R^1 is H or lower alkyl; or

wherein Z is H, lower alkyl, or aryl, SO_2—Q (wherein Q is lower alkyl or aryl),

or OR^2 wherein R^2 is H;

Y is substituted alkyl (wherein the substituent is halo, lower alkoxy, alkyl-aryl, haloalkyl, cycloalkyl or alkylcycloalkyl); aryl-lower alkyl; alkenyl containing 3 to 6 carbons; alkynyl containing 3 to 6 carbons; aryl (which may be unsubstituted or substituted with lower alkyl, halogen or lower alkoxy); cycloalkyl; substituted cycloalkyl; cycloalkylalkyl; substituted cycloalkylalkyl; or phenoxymethyl;

wherein alkyl or lower alkyl by itself or as part of another group contains 1 to 12 carbons, cycloalkyl by itself or as part of another group contains 3 to 12 carbons in the ring portion, aryl by itself or as part of another group refers to a monocyclic or bicyclic armomatic ring which contains 6 to 10 carbons in the ring portion, and the cycloalkyl group by itself or as part of another group may be substituted with 1 or 2 halogens, 1 or 2 lower alkyl groups or lower alkoxy groups (the above substituents not being adjacent to sterically hindered groups);

and represents a single bond or double bond, with the proviso that where represents a double bond, A is CH=CH and B is CH=CH or $(CH_2)_2$ and Y is other than alkenyl or alkynyl, or a pharmaceutically acceptable salt thereof.

479-975 O.G.-85-12

4,537,905

FUNGICIDALLY ACTIVE SUBSTITUTED OXIMINOACETANILIDES

Wilhelm Brandes, Leichlingen, and Werner Daum, Krefeld, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

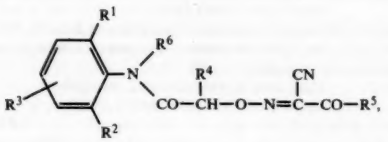
Filed Jan. 27, 1983, Ser. No. 461,304

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1982, 3206235

Int. Cl.[3] **A01N** *37/34, 43/64;* **C07C** *121/84;* **C07D** *249/08*

U.S. Cl. 514—521 **7 Claims**

1. A substituted oximinoacetanilide of the formula



in which

R^1 denotes an alkyl or alkoxy group having 1 to 4 carbon atoms or a halogen atom,

R^2 denotes a hydrogen or halogen atom or an alkyl group having 1 to 4 carbon atoms or trifluoromethyl group,

R^3 denotes a hydrogen or halogen atom or an alkyl group having 1 to 4 carbon atoms,

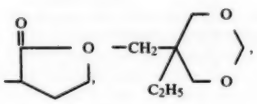
R^4 denotes a hydrogen atom or a methyl group,

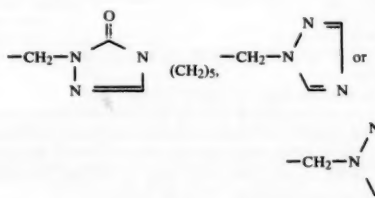
R^5 denotes an alkoxy group having 1 to 4 carbon atoms, amino or —NH—CO—NH—R^7 group,

wherein

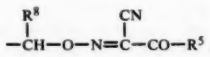
R^7 is a hydrogen atom or an optionally cyano-, C_1–C_4-alkoxy- or alkoxycarbonyl-substituted C_1–C_{15}-alkyl group, or represents a C_3–C_6-cycloalkyl group, and

R^6 denotes a C_3 to C_5 alkinyl, C_1 to C_4 alkoxy-C_1 to C_3 alkyl, halogeno-C_1 to C_4 alkoxy-C_1 to C_3 alkyl, cyano-C_1 to C_4 alkoxy-C_1 to C_3 alkyl, C_4 to C_7 cyclo-alkoxy-C_1 to C_3 alkyl, C_2 to C_4 alkenoxy-C_1 to C_3 alkyl, C_2 to C_4 alkinoxy-C_1 to C_3 alkyl, C_1 to C_4 alkylthio-C_1 to C_3 alkyl, (C_1 to C_4 alkyl)carbonyl-C_1 to C_3 alkyl, (C_1 to C_4 alkoxy)carbonyl-C_1 to C_3 alkyl or (C_1 to C_4 alkylthio)carbonyl-C_1 to C_3 alkyl group; denotes an aminocarbonyl-C_1 to C_3 alkyl group, wherein the amino group thereof is optionally substituted by 1 to 2 C_1 to C_3 alkyl radicals; denotes





or denotes a radical of the general formula



wherein R^8 is a hydrogen atom or a methyl or ethyl group.

5. A fungicidal composition comprising a fungicidally effec-

tive amount of a compound according to claim 1 in admixture with a diluent.

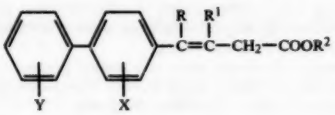
4,537,906

SUBSTITUTED PHENYLALKENOIC ACIDS AND ESTERS

Patrice C. Belanger, Dollard des Ormeaux, and John W. Gillard, Pointe Claire, both of Canada, assignors to Merck Frosst Canada, Inc., Quebec, Canada

Filed Dec. 6, 1982, Ser. No. 446,909
Int. Cl.³ C07C 69/76; A01N 37/00
U.S. Cl. 514—532 8 Claims

1. A pharmaceutical composition useful for treating asthma or for treating or inhibiting blood platelet aggregation comprising a pharmacologically effective amount of the cis isomer of a compound having the formula

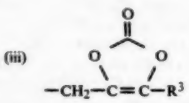


wherein

R is H or C_1–C_4 alkyl,

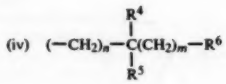
R_1 is H or C_1–C_4 alkyl,

R^2 is (i) hydrogen, (ii) C_1–C_6 alkyl,



II

wherein R^3 is C_1–C_6 alkyl or aryl; or



wherein

n is 0, 1, 2, or 3;

m is 0, 1, 2, or 3;

R^4 and R^5 are individually H or alkyl of 1 to 3 carbon atoms; and

R^6 is selected from the group consisting of

(A) a monocyclic or bicyclic heterocyclic radical containing from 3 to 12 nuclear carbon atoms and 1 or 2 nuclear hetero atoms selected from N and S with at least one being N, and with each ring in the said heterocyclic radical containing 5 to 6 members and

(B) the radical X-R^7 wherein X is —O—, —S—, or —NH— and R^7 contains up to 21 carbon atoms and is (1) a hydrocarbon radical or (2) an acyl radical of an organic acyclic or monocyclic carboxylic acid containing not more than 1 hetero atom in the ring,

Y is H, halo, C_1–C_4 alkoxy, carboxy, C_1–C_6 alkyl or azido, and

X is H, halo, C_1–C_4 alkoxy, carboxy, C_1–C_6 alkyl or azido, and pharmaceutically acceptable salts thereof.

4,537,907

HYPNOTIC COMPOSITION AND METHOD OF INDUCING SLEEP

Miodrag Radulovacki, Evanston, Ill., assignor to University of Illinois Foundation, Urbana, Ill.

Filed Oct. 6, 1980, Ser. No. 194,662
Int. Cl.³ A61K 31/195
U.S. Cl. 514—567 3 Claims

1. A method of providing hypnotic therapy to a mammal comprising, administering to said mammal a hypnotically effective amount of a compound selected from the group consisting of 2-amino-3-(naphthyl)propanoic acid and its pharmaceutically acceptable salts in a pharmaceutically acceptable carrier therefor.

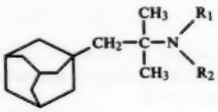
4,537,908

HERPES II TREATMENT

Ronald C. Griffith, Pittsford, and Clyde R. Kinsolving, Fairport, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 277,777, Jun. 26, 1981, Pat. No. 4,351,847. This application Sep. 27, 1982, Ser. No. 425,138
Int. Cl.³ A61K 31/13
U.S. Cl. 514—659 4 Claims

1. A process for the treatment of herpes II virus in a warm blooded animal comprising administering to said animal in need of said treatment an amount effective for said treatment of an anti-viral agent of the formula given below or the acid addition salt thereof;



wherein R_1 and R_2 are selected from the class consisting of H and lower alkyl, said agent being administered orally in conjunction with a topical application in the area of lesions resulting from herpes II virus of said anti-viral agent.

4,537,909

ALCOHOL SYNTHESIS

Fan-Nan Lin, and Filippo Pennella, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 28, 1984, Ser. No. 584,374
Int. Cl.³ C07C 27/06, 29/15
U.S. Cl. 518—713 8 Claims

1. A process for the production of alcohols from synthesis gas which comprises contacting a synthesis gas under suitable reaction conditions with a catalyst consisting of:

(a) at least one copper component,

(b) at least one iron group metal component,

(c) at least one metal component other than compounds (b) having a Periodic element number of 23 to 26,

(d) at least one alkali metal component, and

(e) a promoting amount of about 0.1 to about 5 weight percent of at least one rhodium component, which promoting amount is a small effective amount sufficient to increase catalyst activity and catalyst life without significantly changing selectivity in comparison with the unpromoted catalyst.

4,537,910

METHOD OF PRODUCING CATION-EXCHANGE MEMBRANE HAVING ROUGHED SURFACE

Michiharu Oogai, Hikari; Toru Seita, Shinnanyo; Kosuke Takeshige, Kudamatsu, and Hideo Shuyama, Hofu, all of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shinnanyo, Japan

Filed Nov. 9, 1983, Ser. No. 550,338

Claims priority, application Japan, Nov. 10, 1982, 57-196104; Nov. 11, 1982, 57-196836; Nov. 12, 1982, 57-197690

Int. Cl.³ C08D 5/20

U.S. Cl. 521—27 13 Claims

1. A method of producing a cation-exchange membrane having a roughed surface and high strength said membrane being capable of reducing electrolysis voltage and maintaining current efficiency when used as a membrane in an electrolysis cell, said method comprising mixing silica powder having an average particle diameter of 0.01–20μ, with water to give a suspended or pasty mixtures, supporting the resultant mixture on art paper or filter paper, drying the mixture to form silica powder layer, adhering with heating and pressing the silica powder layer on a surface of membrane composed of perfluorocarbon polymer having cation-exchange group and/or group convertible into the cation-exchange group, and removing the silica powder layer formed on the surface of said membrane with caustic alkali aqueous solution.

4,537,911

INTERFACE BEADS FOR MIXED-BED ION EXCHANGE RESINS

Yohannes Chonde, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 13, 1984, Ser. No. 570,561

Int. Cl.³ C08D 5/20

U.S. Cl. 521—28 19 Claims

1. A bead for a cation and anion mixed-bed ion exchange resin composition, which bead is an essentially spherical, hydrolytically stable polymer bead having a controlled particle size, a controlled density and a water wettability, wherein said bead comprises the polymerization product of a major amount of at least one monoethylenically unsaturated hydrophobic monomer, at least one polyethylenically unsaturated monomer, and minor amount of a monoethylenically unsaturated ionizable hydrophilic monomer which contains anionic or cationic moieties such that said bead does not exhibit a significantly titratable amount of hydrophilic moieties.

4,537,912

PROCESS FOR RAPID CURING OF POLYETHER POLYURETHANE FOAM

Azel A. Griswold, Charlotte, N.C., assignor to Reeves Brothers, Inc., Spartanburg, S.C.

Filed Sep. 5, 1984, Ser. No. 647,583

Int. Cl.³ C08G 18/14

U.S. Cl. 521—53 10 Claims

1. A process for the rapid post curing of polyether polyurethane foam blocks without adversely affecting the compression set of said foam which process comprises subjecting said polyether polyurethane foam having a porosity of greater than about 3 cubic feet per minute to a mixture of air and gaseous ammonia, primary or secondary amine at a temperature of above about 50° F., wherein the amount of ammonia, primary or secondary amine is present at a concentration of at least 0.5% by volume of the air, the air has a relative humidity above about 50% and the air/ammonia or primary amine mixture reacts with the foam for a period of at least one minute.

4,537,913

METHOD OF PREPARING A UREA-FORMALDEHYDE COMBINATION FOAM THAT IS LOW IN FORMALDEHYDE

Heinz Baumann, Kleinniedesheim, Fed. Rep. of Germany, assignor to Schaum-Chemie W. Bauer GmbH & Co. KG, Fed. Rep. of Germany

Filed Mar. 7, 1984, Ser. No. 586,966

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1983, 3308237

Int. Cl.³ C08J 9/30

U.S. Cl. 521—107 2 Claims

1. A method of preparing a urea-formaldehyde combination foam that is low in formaldehyde which comprises:

(a) adding to a conventional solution of a urea formaldehyde resin precondensate, before forming, up to 50% urea (relative to the solid resin substance) and one or several connecting agents from the group consisting of, formic acid, acetic acid, oxalic acid, malonic acid, succinic acid, maleic acid, fumaric acid, uric acid, xanthine, hydrochloric acid, sulfuric acid, thiosulfuric acid and phosphoric acid and their salts, calcium chloride, magnesium chloride, magnesium sulfate, sodium chloride and potassium chloride, said connecting agents being added in such quantity and in such a way that the pH of the resulting solution does not fall below 7; and then

(b) foaming the resulting solution with a hardner/foaming-agent solution in a conventional manner.

4,537,914

FLOOR CLEANING AND WAXING COMPOSITION

James A. Smith, Old Tappan, and Betty J. Murphy, Upper Montclair, both of N.J., assignors to Creative Products Resource Associates, Ltd., Clifton, N.J.

Continuation-in-part of Ser. No. 511,185, Jul. 6, 1983, , and a continuation-in-part of Ser. No. 660,350, Oct. 12, 1984,. This application Jan. 4, 1985, Ser. No. 688,864

Int. Cl.³ C08J 9/38, 9/40

U.S. Cl. 521—111 14 Claims

1. A process for preparing a floor cleaning and waxing composition comprising:

(a) forming an aqueous reactant phase comprising about 30–75% by weight of abrasive solid particles, about 0.1–5% of the weight of the solid particles of a silane-coupling agent, about 0.1–10% of a nonionic surfactant, about 0.1–20% of a silicone fluid, about 5–15% wax and about 20–50% water;

(b) mixing said aqueous reactant phase with a water-foamable prepolymer resin which contains at least 2 free isocyanate groups per resin molecule so that the final mole ratio of water to total free isocyanate groups is within the range of about 5–100:1, thereby shaping said resin into a hydrophilic, open-celled, highly reticulated polyurethane foam bun; and

(c) shredding said foam bun.

4,537,915

CHAR RESISTANT FOAMS

Patrick Oberle, Reichstett; Michel Longuet, Haguenau, both of France, and David Walker, Onnens, Switzerland, assignors to Polysar International S.A., Canton of Fribourg, Switzerland

Filed May 9, 1983, Ser. No. 492,712

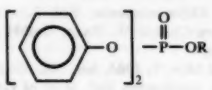
Claims priority, application France, May 7, 1982, 82 07948

Int. Cl.³ C08J 9/30, 9/00

U.S. Cl. 521—84.1 16 Claims

1. A latex composition comprising from about 0 to about 15 parts by dry weight of natural rubber latex and correspondingly from about 100 to about 85 parts by dry weight of styrene-butadiene polymer latex having a styrene:butadiene ratio of from about 20:80 to about 40:60, characterized in that said composition additionally comprises per 100 parts by dry weight of total latex from about 10 to about 30 parts by weight

of a compound selected from the group consisting of an organic phosphate of the formula



wherein R is a C_{6-12} alkyl radical or a phenyl radical which is unsubstituted or substituted by a C_{1-4} alkyl radical, butyl benzyl phthalate, and mixtures thereof.

4,537,916

STRUCTURED LATEX PARTICLES WHICH ARE FILM FORMING AND A PROCESS FOR THEIR PREPARATION

Fabio B. Bruschtein, Midland; Robert G. Jahn, Saginaw, and Edwin L. Wittbrodt, Auburn, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 25, 1984, Ser. No. 624,329

Int. Cl.[3] **C08L** *23/00*

U.S. Cl. 523—201 **20 Claims**

1. A process for preparing a structured latex particle whose film exhibits good film strength having a core and shell region by a continuous addition emulsion polymerization technique wherein said core region is formed from core monomer feeds comprising:

(a) aliphatic conjugated diene monomer feed,

(b) vinylidene halide or vinyl halide monomer feed, and/or

(c) monovinyl aromatic monomer feed,

(d) from about 0 to about 10 percent by weight monoethylenically unsaturated carboxylic acid monomer feed;

and said shell region is formed from shell monomer feeds comprising:

(e) from about 10 to about 20 percent by weight of said latex particle of an acrylate monomer feed, and/or

(f) a monovinyl aromatic monomer or extended core monomer feed (c); and

(g) extended core monomer feeds comprising, independently, (a), (b) or (d);

wherein said process is characterized by adjusting the feed rate of said shell monomer feeds such that as the weight fraction of the shell increases the feed rate of said (e) and (f) monomers are decreased, whereby a shell region which encapsulates said core region is formed and said structured latex particle is rendered film forming at room temperature.

4,537,917

COMPOSITES AND SIZE COATED GLASS FIBERS USED THEREIN

William L. Hergenrother, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 656,211, Oct. 1, 1984, , which is a division of Ser. No. 520,388, Aug. 4, 1984,. This application Feb. 21, 1985, Ser. No. 703,632

Int. Cl.[3] **B32B** *9/00;* **D04H** *1/58*

U.S. Cl. 523—209 **6 Claims**

1. Glass fiber reinforced composite having high flexural strength to density ratio and resistance to strength loss incident to exposure to water, said composite comprising cured unsaturated thermosetting resin reinforced by glass fibers having thereon a size coating comprising maleic anhydride adduct of 1,2-polybutadiene having a number average molecular weight of more than 10,000 and a crystallinity ranging from 0% to 50%, said adduct being soluble in an organic solvent, the amount of said adduct forming the size coating ranging from about 0.1 grams to about 6 grams per 100 grams of glass fibers, said size coated glass fibers being present in an amount ranging from about 20% to about 70% by weight of said composite.

4,537,918

CEMENT COMPOSITIONS FOR CEMENTING WELLS, ALLOWING PRESSURE GAS-CHANNELING IN THE CEMENTED ANNULUS TO BE CONTROLLED

Philippe A. Parcevaux; Bernard M. Piot, both of Saint Etienne, and Claude J. Vercaemer, Sorbiers, all of France, assignors to Etudes et Fabrication Dowell Schlumberger, France

Filed Mar. 30, 1983, Ser. No. 480,334

Claims priority, application France, Apr. 6, 1982, 82 05983; Jan. 24, 1983, 83 01031

Int. Cl.[3] **C04B** *7/35;* **E21B** *33/14, 43/10*

U.S. Cl. 523—130 **17 Claims**

1. Cement slurry compositions for cementing oil wells having improved properties of the cement and inhibiting pressure gas channeling in the cemented annulus, even at high temperature, said composition consisting essentially of a hydraulic cement, about 5–30% by weight of cement of a compatible styrene (70–30 weight percent)/butadiene (30–70 weight percent) copolymer latex, about 1–20% by weight of latex of a latex stabilizer selected from the group consisting of

lignosulfonates and their partly desulfonated derivatives

sulfonic acid or sulfite modified melamine-formaldehyde resins

formaldehyde/sulfonate naphthalene resins, and

condensation products of bi-nuclear sulfonated phenols and of formaldehyde

and water in an amount such that the total fluid content of water, latex and stabilizer is about 30–70% by weight of cement.

14. In the use of cement slurry composition in oil wells, the improvement which comprises employing the cement slurry composition of claim **1** as said cement slurry.

15. In the process of cementing an oil well up to a temperature of 212°–230° F., the improvement which comprises employing the cement slurry composition of claim **1** whereby pressure gas channeling in the cemented annulus is prevented.

4,537,919

GELATION OF HYDROCARBON SOLUTIONS OF BLENDS OF ASSOCIATING AND NON-ASSOCIATING POLYMERS

Pawan K. Agarwal, Westfield, and Robert D. Lundberg, Bridgewater, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Aug. 24, 1984, Ser. No. 643,693

Int. Cl.[3] **C08J** *3/00, 3/20*

U.S. Cl. 523—336 **16 Claims**

1. A process for forming a thickened fluid have a viscosity of at least about 50 cps which includes the steps of:

(a) forming two solvent systems, one of an organic liquid and the other of said organic liquid and a polar cosolvent, said polar cosolvent being less than about 15 weight percent of each said solvent system, a viscosity of each said solvent system being less than about 100 cps;

(b) dissolving a water insoluble sulfonated elastomeric polymer in said first solvent system to form a first solution, a concentration of said sulfonated polymer in said first solution being about 0.2 to about 10 weight percent, a viscosity of said first solution being less than about 2000 cps;

(c) dissolving an elastomeric polymer in said second solvent system of said organic liquid to form a second solution, a concentration of said elastomeric polymer in said second solution being about 0.02 to about 10 weight percent, a viscosity of said solution being less than about 2000 cps, said water insoluble sulfonated elastomeric and said elastomeric polymer having the same polymeric backbone;

(d) mixing said first solution and said solution to form a solution of said sulfonated elastomeric polymer and said elastomeric polymer; and

(e) adding about 5 to about 500 volume percent water to said solution of said sulfonated elastomeric polymer and said elastomeric polymer, said water being immiscible with

said solution of said sulfonated elastomeric polymer and said elastomeric polymer, said polar cosolvent transferring from said organic liquid to said water thereby causing the viscosity of said organic liquid to increase to at least 5000 cps.

4,537,920

4H-1-BENZOPYRANS AND LUBRICANT COMPOSITIONS CONTAINING SAME

Jerry M. Roper, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Aug. 18, 1983, Ser. No. 524,402
Int. Cl.³ C10M *1/20*
U.S. Cl. 252—52 R **17 Claims**

1. A process which comprises reacting one molar proportion of an aminomethylphenol with about 1–10 molar proportions of a 1,3-diketone and about 1–10 molar proportions of an alkali or alkaline earth metal hydroxide at a temperature of at least about 50° C. and a pressure in the range of from atmospheric up to about 1000 psig so as to form a 4H-1-benzopyran.

4,537,921

BLENDED PRESSURE-SENSITIVE ASPHALTIC BASED ADHESIVES

William E. Uffner, Newark; Robert N. White, Etna, both of Ohio, and Edward R. Harrington, Naperville, Ill., assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 407,394, Aug. 12, 1982, Pat. No. 4,478,962.
This application Jan. 30, 1984, Ser. No. 575,248
The portion of the term of this patent subsequent to Apr. 13, 2001, has been disclaimed.
Int. Cl.³ C09J *3/12, 3/30, 7/02*
U.S. Cl. 524—59 **2 Claims**

1. A hot melt blended pressure sensitive adhesive having substantially no cold flow and the ability to stick to cementitious substrates substantially instantaneously upon contact at 40° F., said adhesive consisting essentially of a paving grade asphalt, effective tacky amounts of a depolymerized virgin rubber having a molecular weight from about 10,000 to 110,000, effective viscosity depressing amounts of a terpene resin, and effective cold flow resisting amounts of a non-depolymerized styrene-butadiene copolymer.

4,537,922

SULFUR STABILIZED OXIDIZED POLYOLEFIN COMPOSITION

Irving B. Chang, and Robert E. Beckwith, Jr., both of Morristown, N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Nov. 14, 1983, Ser. No. 551,622
Int. Cl.³ C08F *27/04*
U.S. Cl. 524—82 **11 Claims**

1. A composition comprising an oxidized polyolefin having a number average molecular weight of from 1500 to 6000 and from 0.1 to 25 percent by weight based on the weight of the oxidized polyolefin of a sulfur compound selected from the group consisting of elemental sulfur and sulfur compounds which release elemental sulfur.

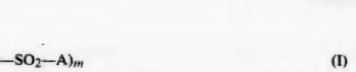
4,537,923

POLYALKYLPIPERIDINESULFONIC ACID ESTERS

Mario Slongo, Tafers, and Friedrich Karrer, Zofingen, both of Switzerland, assignors to Ciba Geigy Corporation, Ardsley, N.Y.

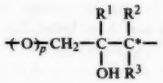
Filed Jun. 13, 1983, Ser. No. 503,436
Claims priority, application Switzerland, Jun. 17, 1982, 3743/82
Int. Cl.³ C08K *5/34*; C08G *63/04*
U.S. Cl. 524—100 **9 Claims**

1. A composition of matter containing an acid-curable resin and a compound of the formulae I



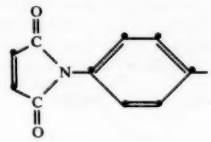
(I)

in which m is a number 1 to 3, X is a direct bond or a group of the formula III

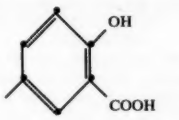


(III)@

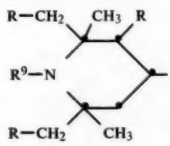
which is attached via C* to the oxygen of the sulfo group, p being zero if the group of the formula III is attached to a nitrogen atom of B, and p otherwise being the number 1, and R^1, R^2 and R^3 independently of one another being hydrogen or methyl, A is C_1–C_{20}-alkyl, C_1–C_4-alkoxy, C_2–C_{12}-alkenyl, C_7–C_{12}-aralkyl, C_6–C_{10}-aryl, C_7–C_{30}-alkaryl, C_5–C_8-cycloalkyl, trifluoromethyl or camphoryl, each of which is unsubstituted or substituted by hydroxyl, a group $—N(R^4)(R^5)$ or $—C(CH_3)_2—CH_2—N(R^6)—C(O)—C(R^7)=CH_2$, in which R^4, R^5 and R^6 are hydrogen or C_1–C_{12}-alkyl and R is hydrogen or methyl, or a group of the formula



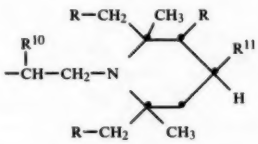
or of the formula



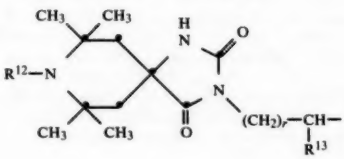
and B, provided that m = 1, is a group of the formulae IV to X



(IV)

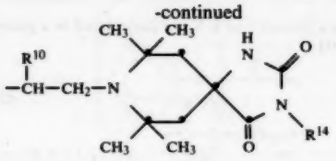


(V)

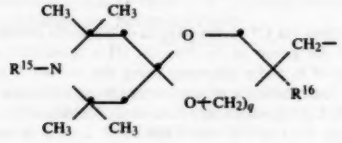


(VI)

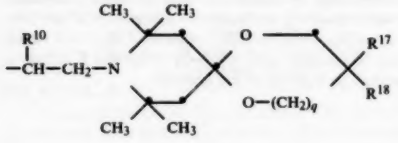
-continued



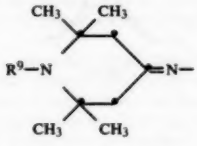
(VII)



(VIII)

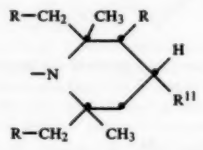


(IX)

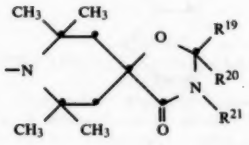


(X)

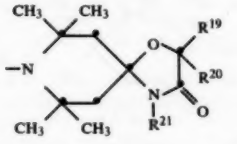
in addition, B, provided that m=1, and provided that X is a group of the formula III, can also be a group of the formulae XI to XVI



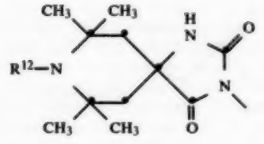
(XI)



(XII)

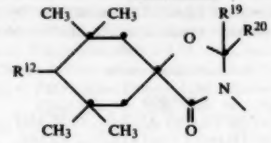


(XIII)

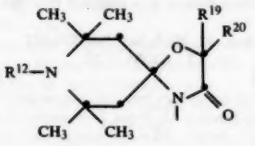


(XIV)

-continued

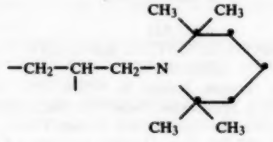


(XV)

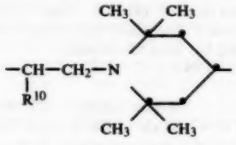


(XVI)

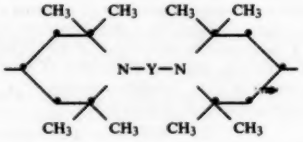
if m=2, B is a group of the formulae XVII to XX



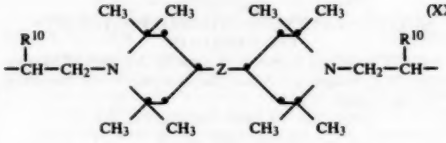
(XVII)



(XVIII)

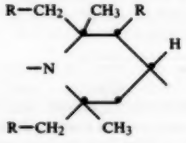


(XIX)

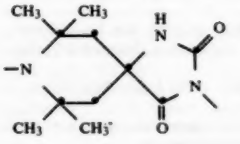


(XX)

in addition, if m=2 and if X is a group of the formula III, B can also be a group of the formulae XXI to XXV

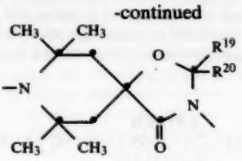


(XXI)

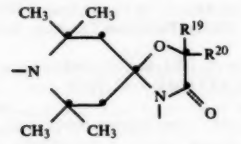


(XXII)

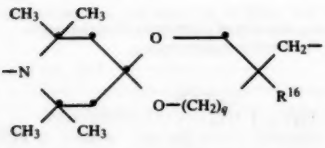
-continued



(XXIII)

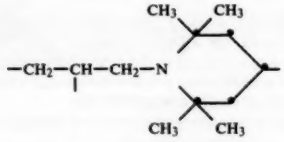


(XXIV)



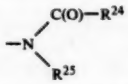
(XXV)

and, if m=3, B is a group of the formula XXVI

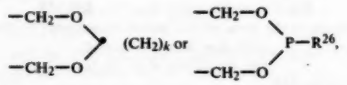


(XXVI)

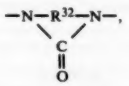
and, if the formulae IV to XXV, R is hydrogen or methyl, R^9 is hydrogen, C_1–C_{20}-alkyl, C_3–C_5-alkenyl, C_3–C_5-alkynyl, C_7–C_{12}-aralkyl, C_1–C_{18}-acyl, C_3–C_{10}-alkoxycarbonylalkyl, C_2–C_4-hydroxyalkyl, cyanomethyl, oxyl, a group of the formula $-CH_2-CH(OH)-CH_2-OR^{27}$ or a group of the formula $-C(O)-N(R^{22})(R^{23})$, R^{10} is hydrogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, phenyl, phenoxy which is unsubstituted or substituted in the phenyl nucleus by C_1–C_4-alkyl, or phenoxymethyl, R^{11} is hydrogen, hydroxyl, C_1–C_{12}-alkoxy, C_3–C_5-alkenyloxy, C_1–C_{12}-acyloxy, C_1–C_{12}-acylamino, C_2–C_{14}-alkoxycarbonyl or a group of the formula



$-C(O)-N(R^{24})(R^{25})$, $-OC(O)-N(R^{24})(R^{25})$, or $-CH_2-COOR^{24}$, R^{12} is hydrogen, C_1–C_{12}-alkyl, C_3–C_5 alkenyl, C_3–C_5-alkynyl, C_7–C_{12}-aralkyl, C_1–C_{18}-acyl, cyanomethyl or C_2–C_4-hydroxyalkyl, R^{13} is hydrogen or C_1–C_4-alkyl, R^{14} is hydrogen, C_1–C_{20}-alkyl, C_3–C_5-alkenyl C_3–C_5-alkynyl, C_7–C_{12}-aralkyl or C_6–C_8-cycloalkyl, R^{15} is hydrogen, C_1–C_{12}-alkyl, C_3–C_5-alkenyl, C_7–C_{12}-aralkyl, C_1–C_{18}-acyl, cyanomethyl or C_2–CHD 4-hydroxyalkyl, R^{16} is hydrogen, methyl or ethyl, R^{17} and R^{18} independently of one another are hydrogen or C_1–C_6-alkyl or R^{17} and R^{18} together are one of the groups of the formulae



R^{19} and R^{20} independently of one another are hydrogen, C_1–C_{12}-alkyl, phenyl which is unsubstituted or substituted by C_1–C_4-alkyl, C_5–C_8-cycloalkyl or C_7–C_{12}-aralkyl or R^{19} and R^{20} together are C_4–C_{11}-alkylene, R^{21} is hydrogen, C_1–C_{12}-alkyl, C_3–C_5-alkenyl, C_1–C_{18}-acyl or C_7–C_{12}-aralkyl, R^{22} and R^{23} independently of one another are hydrogen, C_1–C_{12}-alkyl, C_3–C_5-alkenyl, phenyl or cyclohexyl, R^{24} is C_1–C_{12}-alkyl, R^{25} is hydrogen or C_1–C_{12}-alkyl, R^{26} is C_1–C_4-alkyl, C_1–C_{12}-alkoxy, phenyl, benzyl or phenoxy, R^{27} is C_1–C_4-alkyl or phenyl, r is a number 1 to 4, q is the number 0 or 1, k is a number 4 to 11, Y is ethylene, 1,4-but-2-enylene or o-, p- or m-xylylene, Z is a group of the formulae $-O-R^{28}-O-$, $-OC(O)-R^{29}-C(O)O-$, $-N(R^{30})-C(O)-R^{31}-C(O)-N(R^{30})-$, $-N(R^{30})-C(O)-C(O)-N(R^{30})$, $-C(O)O-R^{31}-OC(O)-$ or



R^{28} is C_2–C_{20}-alkylene, o-, m- or p-xylylene or 1,2-, 1,3- or 1,4-dimethylenecyclohexylene, R^{29} is C_2–C_{20}-alkylene, o-, m- or p-phenylene or C_8–C_{12}-arylenedialkylene, R^{30} is hydrogen, C_1–C_{12}-alkyl, C_7–C_{12}-aralkyl, C_5–C_8-cycloalkyl or phenyl which is unsubstituted or substituted by C_1–C_4-alkyl, R^{31} is C_2–C_{20}-alkylene or o-, m- or p-phenylene or 1,2-, 1,3- or 1,4-cyclohexylene, each of which is unsubstituted or substituted by C_1–C_4-alkyl, and R^{32} is ethylene or propylene, and acid addition salts thereof.

4,537,924

QUADRATIC ACID AMIDE DERIVATIVES, THEIR USE AS STABILIZERS, AND SYNTHETIC RESINS TREATED THEREWITH

Konrad Rombusch; Günther Maahs, and Wolfgang Schäfer, all of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Huels, AG, Marl, Fed. Rep. of Germany

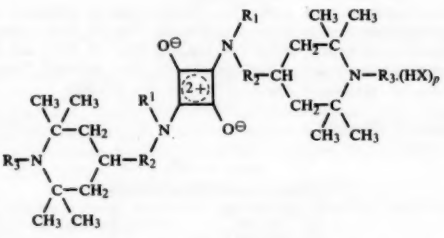
Filed Sep. 14, 1983, Ser. No. 532,127

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1982, 3233954

Int. Cl.[3] **C08K** *5/34*

U.S. Cl. 524—103 **20 Claims**

1. A quadratic acid bisamide or salt thereof having the formula



wherein R_1 is H, $C_{1\text{-}12}$ alkyl or OH-substituted $C_{2\text{-}12}$ alkyl;

R_2 is $-(CH_2)_m-O-_n$, wherein m is an integer of 2–6; n is 0 or 1;

R_3 is H, CH_3, CH_2-CH_2-OH, CH_2-COOH or CH_2-CH_2-COOH;

HX is an acid equivalent of an unsubstituted or substituted monobasic, dibasic or polybasic organic acid of not more than 20 carbon atoms, or of sulfuric or phosphoric acid; and

$0 \leqq p \leqq 2$.

4,537,925

POLYPHENYLENE ETHER BLENDS CONTAINING ELECTROSTATICALLY BOUND ADDITIVE

Bruce A. Luxon, Stamford, Conn., assignor to General Electric Company, Pittsfield, Mass.

Continuation-in-part of Ser. No. 596,559, Apr. 4, 1984, abandoned. This application Nov. 7, 1984, Ser. No. 669,461

Int. Cl.³ C08K *5/42, 5/51*

U.S. Cl. 524—151 **19 Claims**

1. A thermoplastic composition comprising:

(a) a polyphenylene ether resin, alone, or together with another non-ionomerized thermoplastic polymer;

(b) an alkenyl aromatic resin having pendant polar ionic groups thereon; and

(c) one or more property modifying additives bound to the pendant ionic groups of component (b) by electrostatic attraction.

4,537,926

AQUEOUS CHIP RESISTANT COATING COMPOSITION

Daniel M. Kivel, Troy, and Gerhard M. Weber, Detroit, both of Mich., assignors to Grow Group, Inc., New York, N.Y.

Division of Ser. No. 417,857, Sep. 14, 1982, Pat. No. 4,456,507, which is a division of Ser. No. 275,901, Jun. 22, 1981, abandoned. This application Apr. 6, 1984, Ser. No. 597,671

Int. Cl.³ C08K *5/05;* **C08L** *37/00*

U.S. Cl. 524—388 **20 Claims**

1. An aqueous chip-resistant coating composition capable of being applied to a substrate, comprising (a) about 50 to about 90 percent by weight (pbw) film-forming latex binder selected from the group consisting of:

(i) an ethylene vinyl acetate copolymer;

(ii) a carboxylated ethylene vinyl acetate;

(iii) epoxy functional acrylic resin;

(iv) carboxylated styrene-butadiene resin;

(v) carboxylated acrylic;

(vi) hydroxy functional acrylic;

(vii) self-crosslinking acrylic; and

(viii) carboxylated polyvinyl chloride acrylic, and mixtures thereof, dispersed in the water;

(b) about 10 to about 50 pbw filler mixed with the binder to form a composition having a viscosity of at least 5000 centipoise; and

(c) an effective amount of a humectant.

4,537,927

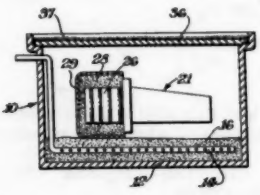
DIFFUSION COATING MIXTURES

Alfonso L. Baldi, Wynnewood, Pa., assignor to Alloy Surfaces Company, Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 398,830, Jul. 16, 1982, and a continuation-in-part of Ser. No. 310,085, Oct. 19, 1981, and a continuation-in-part of Ser. No. 242,350, Mar. 10, 1981, and a continuation-in-part of Ser. No. 851,504, Nov. 14, 1977. This application Jan. 17, 1984, Ser. No. 571,510

Int. Cl.³ C08K *3/10*

U.S. Cl. 524—407 **1 Claim**



1. In a combination of materials for masking against diffusion coating,

(a) a mixture of about 56¼% powdered nickel, about 25% powdered inert refractory, and the balance a prefired combination of nickel powder, aluminum powder, chromium powder and inert refractory powder, and

(b) a solution of resin binder in a readily-evaporated solvent, the solution (b) being in an amount large enough to slurry the mixture (a).

4,537,928

RUBBER COMPOSITIONS CONTAINING ALUMINUM PHOSPHATE

Marvin M. Johnson, and Max P. McDaniel, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 7, 1983, Ser. No. 559,135

Int. Cl.³ C08K *3/32, 3/10*

U.S. Cl. 524—417 **22 Claims**

1. A vulcanizable rubber composition comprising:

(a) a vulcanizable natural rubber or vulcanizable synthetic rubber

(b) a reinforcing amount of aluminum phosphate and,

(c) additive effective for vulcanizing.

4,537,929

HIGH IMPACT NYLON COMPOSITION

Khemchand J. Nangrani, Evansville, Ind., assignor to Plastic Specialties and Technologies, Inc., Neshanic Station, N.J.

Filed Jan. 20, 1984, Ser. No. 572,334

Int. Cl.³ C08K *3/40*

U.S. Cl. 524—504 **25 Claims**

1. A fiber-reinforced molding composition comprising a grafted polyamide resin and a fiber-reinforcing material, said grafted polyamide resin obtained by heating a polyamide resin with an adduct of a polyethylene polymer and an α,β-ethylenically unsaturated dicarboxylic acid compound.

4,537,930

COMPOSITION OF A POLYCARBONATE RESIN AND A SELECTIVELY HYDROGENATED COPOLYMER OF A VINYL AROMATIC COMPOUND AND AN OLEFINIC ELASTOMER

Jan Bussink, Bergen op Zoom; Johannes W. J. DeMunck, Huybergen, and Petrus C. A. Marie van Abeelen, Gilze, all of Netherlands, assignors to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 225,102, Jan. 14, 1981, abandoned, Continuation-in-part of Ser. No. 833,364, Sep. 14, 1977, abandoned. This application Dec. 29, 1982, Ser. No. 454,366

Int. Cl.³ C08L *69/00*

U.S. Cl. 524—505 **26 Claims**

1. A thermoplastic composition having superior resistance to impact fracture in thick-walled molded articles and improved environmental solvent resistance comprising an intimate blend of:

(a) an aromatic polycarbonate resin; and

(b) up to 3.5 parts by weight, based on 100 parts by weight of components (a) and (b) combined, of a selectively hydrogenated linear copolymer of a vinyl aromatic compound $(A)_n$ and $(A^1)_n$ and an olefinic elastomer (B), of the type $A\text{-}B\text{-}A^1$, wherein n is an integer from 1 to 10.

4,537,931

FLOW-REGULATED LATEX SYSTEMS

Gunilla E. Gillberg-La Force, Summit, and Helen A. Kravas, Chatham, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Nov. 14, 1983, Ser. No. 550,844

The portion of the term of this patent subsequent to Nov. 15, 2000, has been disclaimed.

Int. Cl.³ C08L *9/08, 9/10*

U.S. Cl. 524—510 **11 Claims**

1. A shear-thinning aqueous adhesive composition comprising (1) between about 0.1–25 weight percent of water-soluble

associative polyether surfactant, based on the total weight of polymeric components, wherein the associative polyether surfactant is a polymer consisting of a hydrophilic polyoxyalkylene backbone with at least two pendant hydrophobic side chains; (2) water-soluble dihydric phenol-aldehyde resin; and (3) a latex of curable elastomer.

2. A shear-thinning aqueous adhesive composition in accordance with claim 1 wherein the surfactant is a copolymer prepared by copolymerizing a 1,3-dioxolane with a C_8–C_{36} monoepoxide.

4,537,932

RUBBERY CONJUGATED DIENE POLYMERS TERMINATED WITH HYDROCARBYL PHOSPHITES

Carl A. Uraneck, and John E. Burleigh, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 500,680, Jun. 3, 1983, Pat. No. 4,485,833. This application Jul. 30, 1984, Ser. No. 636,052

Int. Cl.³ C08F *8/40*

U.S. Cl. 524—572 **29 Claims**

1. A rubbery conjugated diene polymer, wherein said diene polymer is a polymer of at least one conjugated diene, or copolymer thereof with at least one monovinylarene wherein the copolymerized conjugated diene content is at least 60 weight percent, characterized by treatment of the polymer in hydrocarbon solution as polymer-alkali metal with at least one mole of trihydrocarbyl phosphite or trihydrocarbyl thiophosphite per g-atom of alkali metal in the polymer such that the resulting said diene polymer contains about 0.005 to 0.3 weight percent phosphorus as P.

4,537,933

BLENDS OF POLYOLEFIN GRAFT POLYMERS AND ASA POLYMERS

Leigh E. Walker, Lewiston, and Gautam R. Ranade, Grand Island, both of N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Oct. 12, 1983, Ser. No. 541,399

Int. Cl.³ C08L *51/04, 51/06, 27/06*

U.S. Cl. 525—71 **24 Claims**

1. A polymer composition comprising:

a polymer of a vinyl aromatic compound, an unsaturated nitrile and a base polymer selected from the group consisting of chlorinated polyethylene, an acrylic polymer, and an ethylene, propylene polyene modified polymer, and

a vinyl halide polyolefin graft polymer wherein the vinyl halide alone or in combination with up to 50 percent by weight based on the total weight of monomer of an ethylenically unsaturated compound copolymerizable therewith, and in the liquid state, is polymerized with a polyolefin which comprises a polymer of an aliphatic hydrocarbon monoolefin of 2 to about 8 carbon atoms, and which is in the solid state and is substantially insoluble in the monomer but absorbs a substantial amount of the monomer.

4,537,934

THERMOSETTING ADHESIVE

Jürgen Fock, Düsseldorf, and Dietmar Schedlitzki, Essen, both of Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed Jun. 18, 1981, Ser. No. 275,016

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1980, 3024869

Int. Cl.³ C08F *8/30*

U.S. Cl. 525—123 **6 Claims**

1. A thermosetting adhesive composition comprising

(a) a copolymer obtained by the polymerization of

(a_1) 35 to 70 weight percent of one or more alkyl esters of acrylic or methacrylic acid having 1 to 8 carbon atoms in the alkyl radical,

(a_2) 20 to 45 weight percent of acrylonitrile, methacrylonitrile or vinyl acetate,

(a_3) 10 to 20 weight percent of one or more ω-hydroxyalkyl esters of acrylic or methacrylic acid having 1 to 5 carbon atoms in the alkyl radical,

(a_4) 0 to 15 weight percent of acrylamide or methacrylamide, and

(a_5) 0 to 35 weight percent of acrylic or vinyl monomers, whose composition is different from that of components (a_1) to (a_4),

wherein the sum of the monomers (a_1) to (a_5) totals 100 weight percent and the copolymer possesses a limiting viscosity of 0.05 to 0.6 (100 ml·g^{-1}) at 25° C. in methyl acetate; and

(b) one or more polyisocyanates or the partial reaction product of a polyisocyanate with a polyol, the product having at least 2 isocyanate groups per molecule on the average,

wherein components (a) and (b) are present in a ratio such that one hydroxyl group of component (a) corresponds to 1 to 1.5 isocyanate groups of component (b).

4,537,935

COMPOSITION FOR COLD DRAWN FILM

Isao Yoshimura, Fujisawa; Hideo Hata, and Takashi Kaneko, both of Yokohama, all of Japan, assignors to Asahi-Dow Limited, Tokyo, Japan

Continuation of Ser. No. 457,364, Jun. 12, 1983, abandoned, which is a division of Ser. No. 213,461, Dec. 5, 1980, Pat. No. 4,499,241, which is a division of Ser. No. 949,253, Oct. 6, 1978, Pat. No. 4,277,578. This application Oct. 29, 1984, Ser. No. 665,492

Claims priority, application Japan, Oct. 11, 1977, 52-120917; Nov. 22, 1977, 52-139431; May 30, 1978, 53-63870; May 30, 1978, 53-63872

Int. Cl.³ C08L *31/04, 23/16, 23/10, 23/08*

U.S. Cl. 525—222 **10 Claims**

1. A composition consisting essentially of a homogeneous blend of one of the specific combinations of components, namely the combination of (A)+(B)+(C); wherein

(A) is at least one selected from the group consisting of copolymers of ethylene with vinyl ester monomers, with vinyl ester monomers,

(B) is an elastomer having a density of not more than 0.91 g/cm^3 and made of an ethylene-α-olefin copolymer, and

(C) is crystalline polypropylene and the ratios of the components are such as to satisfy $0.07 \leqq B/(A+B) \leqq 0.70$ and $0.07 \leqq C/(A+B) \leqq 0.8$.

4,537,936

DIENE RUBBER COMPOSITION, METHOD OF PREPARING THE SAME AND TIRE EMPLOYING SAID COMPOSITION

Hiroyoshi Takao, Chiba; Keisaku Yamamoto, Ichihara; Akio Imai, Ichihara; Nobuyuki Yoshida, Ichihara; Hiroshi Furukawa, Kobe; Yuichi Saito, Nishinomiya, and Akio Okumura, Kobe, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka and Sumitomo Rubber Industries, Limited, Kobe, both of, Japan

Filed Apr. 22, 1982, Ser. No. 371,020

Claims priority, application Japan, Apr. 30, 1981, 56-66381; Apr. 30, 1981, 56-66679

Int. Cl.³ C08L *9/00, 9/06*

U.S. Cl. 525—236 **5 Claims**

1. A diene rubber composition comprising 25 to 90 parts by weight of at least one high molecular weight diene rubber (A) having an intrinsic viscosity [η] of 2.5 to 5, a $\overline{Mw}/\overline{Mn}$ value of not more than 2.0 and a glass transition point of not lower than −50° C. and 75 to 10 parts by weight of at least one low molecular weight diene rubber (B) having an intrinsic viscosity [η] of 0.1 to 0.7 and a glass transition point of not lower than −50° C., said composition having an average intrinsic viscosity of at least 1.8.

4,537,937
CHELATING RESIN AND PROCESS FOR MAKING SAME

David W. Cawlfield; William M. Moore, and John L. Stubbs, Jr., all of Cleveland, Tenn., assignors to Olin Corporation, Cheshire, Conn.

Filed Feb. 13, 1984, Ser. No. 579,233
Int. Cl.[3] C08L 79/00
U.S. Cl. 525—417 27 Claims

1. A process for preparing a resin chelating agent comprising:

(a) reacting an aqueous suspension of a polyethyleneimine with a polycarboxylic acid to produce a crosslinked polyamido precursor resin;

(b) breaking up the precursor resin by saturation with a first polar solvent;

(c) grinding the broken precursor resin to a uniform particle size below about 1 millimeter;

(d) suspending said ground precursor resin in a second polar solvent and reacting said precursor resin in a mixture comprising carbon bisulfide and a hydroxyl containing compound selected from the group consisting of alkali metal hydroxides, alkaline earth metal hydroxides, and ammonium hydroxide, whereby said resin chelating agent is produced; and

(e) separating said resin from said mixture.

4,537,938
PROCESS FOR PREPARING POLYOLEFINS

Kazuo Matsuura, Ota; Yutaka Shikatani, Yokohama; Hirofumi Kamiishi, Yokohama; Nobuyuki Kuroda, Yokohama, and Mituji Miyoshi, Fujisawa, all of Japan, assignors to Nippon Oil Company, Limited, Tokyo, Japan

Filed Mar. 21, 1984, Ser. No. 591,912
Claims priority, application Japan, Mar. 29, 1983, 58-51585
Int. Cl.[3] C08F 4/44; C01B 15/14
U.S. Cl. 526—97 6 Claims

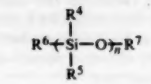
1. A process for preparing a polyolefin, comprising polymerizing at least one olefin in the presence of a catalyst, which catalyst comprises a combination of the following components [I] and [II]:

[I] a solid component obtained by intercontacting and reacting the following components (1) through (4):

(1) a compound obtained by treating an oxide of an element of Groups II–IV in the Periodic Table with a compound represented by the general formula $R^1{}_mSi(OR^2)_nX_{4-m-n}$, used in an amount of 0.0001 to 2 mol per gram of the oxide of an element of Groups II–IV and heating them at a temperature in the range of 0° C. to 500° C. from 10 minutes to 24 hours, wherein R^1 and R^2 being each a hydrocarbon radical having 1 to 24 carbon atoms, a hydrocarbon radical having 1 to 18 carbon atoms containing oxygen, sulfur or nitrogen, or hydrogen, X being a halogen atom, m being $0 \leqq m < 4$ and n being $0 \leqq n \leqq 4$, provided $0 \leqq m+n \leqq 4$,

(2) a reaction product obtained by the reaction of a magnesium halide and a compound represented by the general formula $Me(OR^3)_nX_{z-n}$, where the reaction ratio of the magnesium halide and the compound of the general formula $Me(OR^3)_nX_{z-n}$ being in the range of 1:0.05 to 1:1 in terms of Mg:Me molar ratio, wherein Me, being Na, Mg, Ca, Zn, Cd, Al, B, Ga, Ge, Sn, P, Cr, Mn, Fe, Co, or Ni, with the limitation that silicon, titanium and vanadium being excluded, R^3 being a hydrocarbon radical having 1 to 24 carbon atoms, X being a halogen atom, z being the valence of Me, and n being $0 < n \leqq z$,

(3) a compound represented by the general formula



wherein R^4, R^5 and R^6 being each a hydrocarbon radical having 1 to 24 carbon atoms, an alkoxy group, hydrogen, or a halogen atom, R^7 being a hydrocarbon radical having 1 to 24 carbon atoms, and n being $1 \leqq n \leqq 30$, and

(4) a titanium compound and/or a vanadium compound;

wherein conditions for the intercontacting and reacting of components (1) through (4) being:

(i) intercontacting 0.01 to 5 grams of component (2) per gram of component (1) and at a temperature of 20° to 400° C.; (ii) reacting 0.01 to 5 grams of component (3) per gram of the contacted product of components (1) and (2); and (iii) reacting that reaction product with 1 to 20 wt. % of the titanium compound and/or vanadium compound of component (4); and

an organometallic compound.

4,537,939
PROCESS FOR PRODUCTION OF POLYMERS HAVING INCREASED 1,2-MICROSTRUCTURE

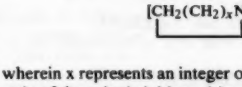
James E. Hall, Akron, Ohio, and Donald N. Schulz, Annandale, N.J., assignors to The Firestone Tire & Rubber Company, Ohio

Division of Ser. No. 394,066, Jul. 1, 1982, Pat. No. 4,476,240.
This application Jun. 4, 1984, Ser. No. 617,407
Int. Cl.[3] C08F 4/48
U.S. Cl. 526—179 20 Claims

1. A process for the preparation of a homopolymer of a 1,3-diene monomer said homopolymer containing a 1,2-microstructure ranging between about 20 and about 65 percent which process comprises polymerizing said 1,3-diene monomer in an in inert non-polar solvent system in the presence of a catalytically effective amount of a catalyst comprising:

(a) an anionic initiator based on lithium, said anionic initiator being selected from the group consisting of organolithium catalysts having the formula $R(Li)_x$ wherein R represents a hydrocarbyl radical of 1 to 20 carbon atoms per R group and x is an integer of 1–4, phenyllithium, naphthyllithium, 4-butylphenyllithium, p-tolyllithium, 4-phenylbutyllithium, 4-butylcyclohexyllithium, 4-cyclohexylbutyllithium, 1,4-dilithiobutane, 1,10-dilithiodecane, 1,20-dilithioeicosane, 1,4-dilithionaphthalene, 9,10-dilithioanthracene, 1,2-dilithio-1,2-diphenylethane, 1,3,5-trilithiopentane, 1,5,15-trilithioeicosane, 1,3,5-trilithiocyclohexane, 1,3,5,8-tetralithiodecane, 1,5,10,20-tetralithioeicosane, 1,2,4,6-tetralithiocyclohexane, 4,4'-dilithiobiphenyl, lithium dialkyl amines, lithium dialkyl phosphines, lithium alkyl aryl phosphines and lithium diaryl phosphines, and

(b) a phosphine oxide modifier represented by the structural formula:



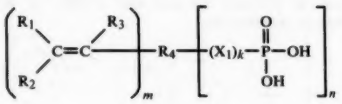
wherein x represents an integer of 3, 4 or 5, in which the molar ratio of the anionic initiator (a) to the phosphine oxide modifier (b) ranges between about 1.0/0.1 to about 1.0/10.0 in which the temperature of polymerization initiation is at least 0° C. and in which the millimoles of the anionic initiator per 100 grams of the 1,3-diene monomer ranges between about 0.2 and about 100.

4,537,940
ADHESIVE COMPOSITIONS

Ikuo Omura; Junichi Yamauchi, both of Kurashiki; Yoshinori Nagase, Takatsuki, and Fumiko Uemura, Kurashiki, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Continuation of Ser. No. 570,292, Jan. 13, 1984, Pat. No. 4,499,251. This application Oct. 10, 1984, Ser. No. 659,455
Claims priority, application Japan, Jan. 21, 1983, 58-9170
Int. Cl.³ C09K *3/00;* **C09J** *3/14;* **C08F** *30/02*
U.S. Cl. 526—278 **12 Claims**

1. An adhesive composition which comprises 1 part by weight of (a) a compound of the general formula:



wherein

R_1 represents H, a hydrocarbon group of 1–6 carbon atoms, a hydrocarbon group of 1–6 carbon atoms containing halogen, COOR′, wherein R′ represents a hydrocarbon group of 1–20 carbon atoms, a hydrocarbon group of 1–20 carbon atoms containing halogen or halogen;

R_2 is as defined for R_1;

R_3 represents H, a hydrocarbon group of 1–6 carbon atoms, a hydrocarbon group of 1–6 carbon atoms containing halogen, halogen or CN;

H_4 represents $(COX_2)_{m1}(CO)_{m2}(ZCO)_{m3}(Z)_{m4}Ra$ wherein Ra represents an organic residue of 6–60 carbon atoms and a valency of m+n; m1, m2, m3 and m4 each represents an integer of 0–4 and satisfies $m1+m2+m3+m4 \leqq m$; X_2 represents O, S or NRb, wherein Rb represents H or alkyl of 1–4 carbon atoms and Z represents O or S;

X_1 is as defined for X_2;

m is an integer of 1–4;

n is an integer of 2–6; and

k is 0 or 1,

and 0–199 parts by weight of (b) a vinyl monomer copolymerizable with the aforesaid compound.

4,537,941
LIGNIN-MODIFIED PHENOLIC ADHESIVES FOR PRESSED WOOD PRODUCTS

Stamatis M. Kambanis, Toronto; Antoine Berchem, Rosemere; Dennis Gregoire, Laval, and Jaroslav Rybicky, Brampton, all of Canada, assignors to Reichhold Limited, Ontario, Canada

Filed Aug. 28, 1984, Ser. No. 644,949
Int. Cl.³ C08G *8/28;* **C08H** *5/02*
U.S. Cl. 527—403 **35 Claims**

1. A process for the preparation of a lignin-modified phenol-formaldehyde resin which comprises reacting together phenol, formaldehyde, lignosulfonate, potassium ferricyanide, and an alkali or alkaline earth basic catalyst in the following ratios:

(a) phenol/formaldehyde: from 1:1.8 to 1:3.0, on a molar basis;

(b) phenol/basic catalyst: from 1:0.1 to 1:0.5, on a molar basis;

(c) phenol/potassium ferricyanide: from 100:1 to 10:1, on a weight basis; and

(d) phenol/lignosulfonate: from 1:0.1 to 1:0.5 on a weight basis as lignosulfonate solids, or from 1:0.2 to 1:1.0 on a weight basis as lignosulfonate liquor containing approximately 50% by weight solids,

and continuing the reaction until a desired viscosity is reached, provided that the potassium ferricyanide is added either with or before the phenol.

23. A modified phenol-formaldehyde resin containing lignosulfonate, obtained by reacting together phenol, formaldehyde, lignosulfonate, potassium ferricyanide, and an alkali or alkaline earth basic catalyst in the following ratios:

(a) phenol/formaldehyde: from 1:1.8 to 1:3.0, on a molar basis;

(b) phenol/basic catalyst: from 1:0.1 to 1:0.5, on a molar basis;

(c) phenol/potassium ferricyanide: from 100:1 to 10:1, on a weight basis; and

(d) phenol/lignosulfonate: from 1:01 to 1:0.5 on a weight basis as lignosulfonate solids, or from 1:0.2 to 1:1.0 on a weight basis as lignosulfonate liquor containing approximately 50% by weight solids, and continuing the reaction until a desired viscosity is reached, provided that the potassium ferricyanide is added either with or before the phenol.

4,537,942
POLYHYDRIDOSILANES AND THEIR CONVERSION TO PYROPOLYMERS

Katherine A. Brown-Wensley, Lake Elmo, and Robert A. Sinclair, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

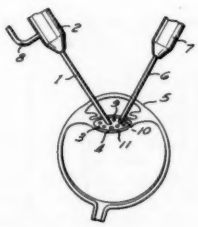
Continuation-in-part of Ser. No. 579,017, Feb. 10, 1984, abandoned. This application Apr. 6, 1984, Ser. No. 597,540
Int. Cl.³ C08G *77/06*
U.S. Cl. 528—12 **19 Claims**

1. A polyhydridosilane having a catenated silicon backbone having an average of 20 to 4000 silicon atoms with a number of hydride atoms per silicon atom in the range of 0.3 to 2.2, at least 0.1 gram of said polyhydridosilane being soluble at 20° C. in 100 grams of at least one of the organic solvents selected from the group consisting of tetrahydrofuran, toluene, and methylene chloride, said polyhydridosilane being tractable and moisture-sensitive.

4,537,943
CORRECTION OF DEFECTS IN THE EYE AND COMPOSITIONS THEREFOR

Thomas D. Talcott, Irvine, Calif., assignor to Innovative Surgical Products, Inc., Santa Ana, Calif.

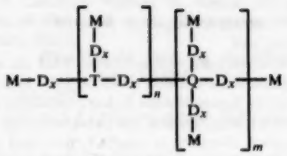
Filed Jul. 21, 1983, Ser. No. 515,789
Int. Cl.³ C08G *77/06*
U.S. Cl. 528—15 **24 Claims**



1. A composition for forming in vivo a lens in the eye of a human being or other animal, said composition being substantially curable at body temperature to form a lens which is optically clear and remains so in the presence of physiological fluids, said composition being free of filler material and comprising:

(a) a crosslinkable organosiloxane polymer containing crosslinkable hydrogen or alkenyl groups and having the average formula:

(I)



wherein:

M is a monofunctional, silicon-containing, chain capping residue; D is a difunctional, siloxane monomer unit, T is a trifunctional, siloxane monomer unit; and Q is a tetrafunctional siloxane monomer unit; and m and n are average numbers whose total is from about 2 to about 1000, n being a positive number greater than zero, m being zero or a positive number greater than zero; the average degree of polymerization of said polymer being from about 100 to about 20,000, the value of said degree of polymerization and m and n determining the average value of x;

(b) an organosiloxane crosslinker polymer containing alkenyl groups when polymer (a) contains said crosslinkable hydrogen groups or hydrogen groups when said polymer (a) contains said crosslinkable alkenyl groups, polymer (b) having at least one of the following general formulae (i), (ii) and (iii):

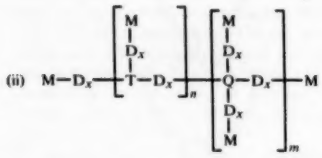
(VIII)

(i)

wherein the R substituents are substituted or unsubstituted and are the same or different and are selected from the group consisting of alkyl, aryl, alkaryl and aralkyl; R^1 is hydrogen or alkenyl; and q is an average number from about 1 to 250 times the value of q', q' being an average number of from about 3 to 20; the material of Formula VIII having an average degree of polymerization of from about 50 to 5,000, the average value of q being determined by the difference between the degree of polymerization and the average value of q';

(VIII A)

(ii)



wherein

M is a monofunctional, silicon-containing, chain-capping residue;

D is a difunctional siloxane monomer unit;

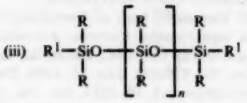
T is a trifunctional siloxane monomer unit; and

Q is a tetrafunctional siloxane monomer unit; and

wherein n and x are average positive numbers, m is 0 or an average positive number, the total of n+m being from about 2 to 100 and, when m=0, n alone has these values, the degree of polymerization (DP) being from 50 to 5,000; and

(VIII B)

(iii)



wherein R and R^1 are as defined above, n is an average number substantially equal to the average degree of polymerization of the material which is from about 50 to 5,000; and

(c) a platinum complex catalyst capable of promoting a crosslinking reaction between said hydrogen or alkenyl groups in polymer (a) and said alkenyl or hydrogen groups in polymer (b).

4,537,944

ROOM TEMPERATURE CURABLE POLYORGANOSILOXANE COMPOSITION

Takafumi Imai, and Fumihiko Kobayashi, both of Ohta, Japan, assignors to Toshiba Silicone Co., Ltd., Tokyo, Japan

Filed Jun. 21, 1984, Ser. No. 623,275

Claims priority, application Japan, Jul. 11, 1983, 58-125649

Int. Cl.³ C08G 77/06

U.S. Cl. 528—18 **20 Claims**

1. A room temperature curable polyorganosiloxane composition comprising:

(A) 100 parts by weight in total of:

(1) a polydiorganosiloxane of the general formula:

$$R_a^1(R^2O)_{(3-a)}SiO—R_2SiO—_nSi(OR^2)_{(3-a)}R_a^1$$

wherein R and R^1 are the same or different and represent a monovalent substituted or unsubstituted hydrocarbon group, R^2 represents a monovalent group selected from the group consisting of alkyl groups having 1 to 4 carbon atoms and alkoxyalkyl groups having 1 to 6 carbon atoms in total, a represents a number of 0 or 1 and n represents a number for controlling the viscosity of (a) from 100 to 500,000 cP at 25° C., and

(2) a silane of the general formula:

$$R_b^3Si(OR^4)_{4-b}$$

wherein R^3 represents a monovalent substituted or unsubstituted hydrocarbon group, R^4 represents a monovalent group selected from the group consisting of alkyl groups having 1 to 4 carbon atoms and alkoxyalkyl groups having 1 to 6 carbon atoms in total and b represents a number of 0 or 1, or a partially hydrolyzed condensate thereof with the proviso that the amount of (A)(1) is 85 to 100 wt. % based on the total of (A)(1) and (A)(2);

(B) 0.01 to 10 parts by weight of a curing catalyst;

(C) 0.5 to 10 parts by weight of a nitrogen-containing silicon compound in which the nitrogen atom is bonded with a silicon atom through one or more carbon atoms and said nitrogen atom is further bonded directly with said silicon atom or another silicon atom; and

(D) 0.05 to 50 parts by weight of a polyoxyalkylene chain-containing compound.

4,537,945
POLYETHER DERIVATIVE AND A POLY(URETHANE)UREAMIDE OBTAINED THEREFROM

Kozo Otani, Hyogo, and Yoshio Yamada, Osaka, both of Japan, assignors to Toyo Tire & Rubber Company Limited, Osaka, Japan

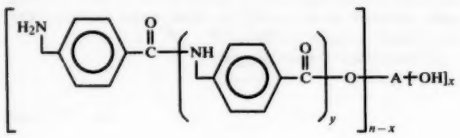
Filed Sep. 17, 1984, Ser. No. 651,264

Claims priority, application Japan, Apr. 2, 1984, 59-66599; Jun. 16, 1984, 59-124019

Int. Cl.³ C08G *18/32, 18/60;* C07C *101/00*

U.S. Cl. 528—68 **8 Claims**

1. A polyether derivative of the formula



wherein

A is an n-valent radical obtained by removal of hydroxyl groups from an n-valent polyoxyalkylenepolyol having a molecular weight of 400 to 10,000,

n is an integer of 2 to 8,

x is an average value and a number of $0 \leqq x < (n-1)$ and

y is an average value and a number of $0.05 \leqq y < 1$.

4,537,946
CURABLE MIXTURES CONTAINING EPOXY RESINS AND ISOMELAMINES

Friedrich Lohse, Oberwil, and Helmut Zondler, Bottmingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 466,454, Feb. 15, 1983, Pat. No. 4,499,268. This application Nov. 28, 1984, Ser. No. 675,906

Claims priority, application Switzerland, Feb. 23, 1982, 1105/82

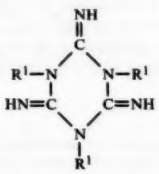
Int. Cl.³ C08G *59/50*

U.S. Cl. 528—118 **4 Claims**

1. A curable mixture which comprises

(a) an epoxy resin having more than one epoxy group in the molecule, and

(b) an isomelamine of formula I



(I)

in which each R^1 is alkyl having 1 to 8 C atoms, aralkyl having not more than 12 C atoms, allyl or methallyl, in which there are 0.75 to 1.25 NH equivalents per epoxide equivalent.

4,537,947
CHAIN-EXTENDING FUNCTIONAL POLYIMIDES BY DIPOLE REACTIONS

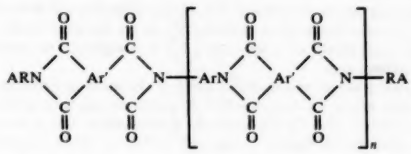
Gaetano F. D'Alelio, South Bend, Ind., assignor to University of Notre Dame du Lac, Notre Dame, Ind.

Division of Ser. No. 363,801, May 25, 1973, Pat. No. 3,897,395. This application Mar. 14, 1975, Ser. No. 558,447

Int. Cl.³ C08G *20/32*

U.S. Cl. 525—424 **26 Claims**

1. A polymeric chain-extending process comprising: reacting one mole of a polyimide of the formula:



wherein

Ar' is a tetravalent aromatic organic radical, the four carbonyl groups being attached directly to separate carbon atoms and each pair of carbonyl groups being attached to adjacent carbon atoms in the Ar' radical,

Ar is a divalent aromatic organic radical,

R is a hydrocarbon radical of 1 to 12 carbon atoms, and

n is a positive integer of at least one, and

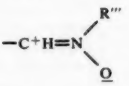
A is a radical selected from the group consisting of $-CH{=}CHR^{\circ}$, $-C{\equiv}CR^{\circ}$, $-CN$, $-CHO$ and $-CH{=}NR''$ wherein R'' is a monovalent aromatic organic radical of 6 to 12 carbon atoms and R° is H or R, with at least ½ mole of an aromatic bis-dipole of the formula:

wherein

Ar is as defined above and

Q is selected from the group consisting of

$-C^{+}NO^{-}$, $-C^{+}N{=}N^{-}R'''$, $-C^{+}{=}N^{-}CHR'''$ and



wherein R''' is an aliphatic or aromatic organic radical of 1 to 12 carbon atoms.

4,537,948
PROCESS FOR THE PRODUCTION OF POLYPHENYLENE OXIDES

Martin Bartmann, Recklinghausen; Hanns-Jorg Bax; Klaus Burzin, both of Marl, and Wilfried Ribbing, Dorsten, all of Fed. Rep. of Germany, assignors to Chemische Werke Huls AG, Marl, Fed. Rep. of Germany

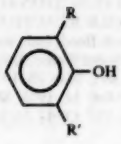
Filed Feb. 23, 1984, Ser. No. 582,711

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1983, 3313864

Int. Cl.³ C08G *65/44*

U.S. Cl. 528—215 **15 Claims**

1. A process for the production of polyphenylene oxides which comprises oxidatively coupling a diorthosubstituted phenol having the formula:



wherein R and R' are C_1–C_6 n-alkyl or phenyl, in the presence of an oxidizing gas and an activated copper (II)-amine catalyst, consisting of a mixture of

(a) equivalents of a copper salt, CuX_2 of the formula wherein X is the anion of an organic acid or an inorganic acid;

(b) equivalents of a secondary C_4–C_{10} aliphatic or cyclic amine; and

(c) equivalents of a hydrobromide of the same or a different secondary C_4–C_{10} aliphatic or cyclic amine; in a solvent mixture of a C_6–C_8 aromatic hydrocarbon and a lower aliphatic alcohol in a ratio of 92.5:75 to 50:50; thereby preventing precipitation of the formed polyphenylene oxide during reaction.

4,537,949

CONTINUOUS PREPARATION OF NYLON WITH DIAMINE RECYCLING

Franz Schmidt, Mannheim; Gunter Pipper, Bad Durkheim; Josef G. Floss, Neustadt, and Franz Zahradnik, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 14, 1984, Ser. No. 620,563

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1983, 3321581

Int. Cl.³ C08G *69/28*

U.S. Cl. 528—335 **10 Claims**

1. A process for the continuous preparation of a nylon, which comprises

(a) passing an aqueous solution of a salt of a dicarboxylic acid of 6 to 18 carbon atoms and a diamine of 6 to 18 carbon atoms through an evaporator zone, a residence time of not more than 60 seconds being maintained,

(b) heating the aqueous solution in the evaporator zone to 250°–300° C. under superatmospheric pressure of from 1 to 10 bar, with evaporation of water, and not less than 93% conversion of the salt to form a vapor phase mixed with a prepolymer containing not more than 7% by weight of water,

(c) separating off the prepolymer from the vapor phase,

(d) transferring the prepolymer to a condensation zone,

(e) condensing the prepolymer in the condensation zone under superatmospheric pressure of from 1 to 10 bar and at from 250° to 300° C., and

(f) rectifying the vapor obtained in stage (c) in a column, with separation into steam and diamine, and recycling of the diamine to stage (a).

4,537,950

POLYVINYLENE SULFIDE AND POLYVINYLENE SELENIDE

Shu Kambara, Tokyo; Tatsumi Arakawa, Fuji, and Akio Takahashi, Otsu, all of Japan, assignors to Director-General of Agency of Industrial Science and Technology, Tokyo, Japan

Filed Mar. 1, 1983, Ser. No. 471,152

Claims priority, application Japan, Apr. 14, 1982, 57-60943

Int. Cl.³ C08L *81/02*

U.S. Cl. 528—380 **9 Claims**

1. A polyvinylene chalcogenide represented by the following structural formula (I):

$$—CH=CH—L)_n \qquad (I)$$

wherein L stands for sulfur or selenium.

4,537,951

PROCESS FOR THE PRODUCTION OF OPTIONALLY BRANCHED POLYARYLENE SULFIDES

Karsten Idel, Krefeld; Edgar Ostlinning, Duesseldorf; Wolfgang Koch, Bischoffen; Ludwig Bottenbruch, Krefeld, and Walter Heitz, Kirchhain, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 23, 1984, Ser. No. 592,698

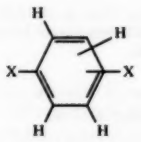
Claims priority, application Fed. Rep. of Germany, Apr. 5, 1983, 3312284

Int. Cl.³ C08G *75/14*

U.S. Cl. 528—388 **9 Claims**

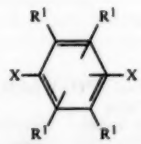
1. A process for the production of an optionally branched, high molecular weight polyarylene sulfide having a high melt viscosity, comprising reacting in the presence of a reducing agent selected from hydrazine, alkali metal borohydrides, alkali metal formates; a mixture of

(a) from 100 to 0 mole percent



(I)

and from 0 to 100 mole percent



(II)

where the sum of (I) and (II) is 100 mole percent, and where each X is independently chlorine or bromine in the meta or para position to one another and where each R^1 is independently hydrogen, an alkyl containing from one to twenty carbon atoms, a cycloalkyl containing from five to twenty carbon atoms, an aryl containing from six to twenty-four carbon atoms, an alkaryl containing from seven to twenty-four carbon atoms, or an aralkyl containing from seven to twenty-four carbon atoms, where two of R^1 in the ortho position to one another may be attached to form an aromatic or 6-membered heterocyclic ring containing up to 3 heteratoms, and where one of R^1 is always different from hydrogen; and

(b) from 0 to 3.0 percent, based on the sum of (I) and (II), of an aromatic trihalogen or tetrahalogen compound

$$ArX_n$$

where Ar is an aromatic or heterocyclic moiety having from six to twenty-four carbon atoms and up to 3 heteroatoms, X is chlorine or bromine, and where n is 3 or 4;

(c) an alkali metal sulfide, in a molar ratio (a+b):c of from 0.85:1 to 1.15:1; and

(d) at least one polar solvent, in a molar ratio of c:d of from 1:2 to 1:15.

4,537,952

POLYMERIC COMPOUNDS PREPARED FROM DIPHENYLAMINE AND DIALKYLALKENYLBENZENE OR DIHYDROXYALKYLBENZENE

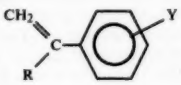
Richard E. Gloth, Copley; James J. Tazuma, Stow, and Robert A. Smith, Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 460,979, Jan. 26, 1983, Pat. No. 4,463,170. This application May 21, 1984, Ser. No. 612,281

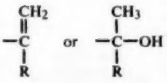
Int. Cl.³ C08G *73/00*

U.S. Cl. 528—392 **11 Claims**

1. A polymeric reaction product of diphenylamine and an additonal component comprising one or more meta or para substituted compounds of the structure:



wherein Y is the



and R is an alkyl radical of from 1 to 8 carbon atoms.

4,537,953

PROCESS FOR PRODUCING AROMATIC SULFIDE POLYMER WITH ALKALINE EARTH METAL OXIDE DEHYDRATING AGENT

Yukichika Kawakami; Zenya Shiiki, and Yo Iizuka, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 6, 1984, Ser. No. 647,733

Claims priority, application Japan, Sep. 7, 1983, 58-164692

Int. Cl.³ C08G *75/16*

U.S. Cl. 528—388 **8 Claims**

1. In a process for producing an aromatic sulfide polymer which comprises subjecting (A) a hydrous sulfide of a metal selected from the group consisting of alkali metals and alkaline earth metals and (B) a dihalo-aromatic compound to a reaction in an aprotic solvent to form the aromatic sulfide polymer, the improvement which comprises contacting in the aprotic solvent the hydrous sulfide (A) with an effective amount of (C) an alkaline earth metal oxide before said reaction between the reactants (A) and (B) is substantially initiated thereby to dehydrate the hydrous sulfide (A).

4,537,954

PROCESS FOR THE PREPARATION OF POLYMER COMPOSITIONS HAVING LOW VOLATILE CONTENT

Toshihiko Ando; Norifumi Ito; Tetsuyuki Matsubara, all of Yokohama; Kozo Ichikawa, Hatano; Susumu Fukawa, Hiratsuka, and Tetsuo Maeda, Urayasu, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc. and Toyo Engineering Corporation, both of Tokyo, Japan

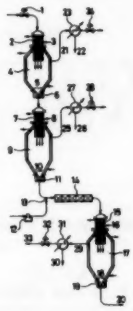
Filed Mar. 8, 1984, Ser. No. 587,592

Claims priority, application Japan, Mar. 14, 1983, 58-41796

Int. Cl.³ C08F *6/00;* **C08G** *6/00;* **C08J** *3/00*

U.S. Cl. 528—481 **9 Claims**

1. A continuous process for the preparation of polymer compositions having low volatile content which comprises passing a styrene polymer-containing polymerization fluid composition obtained by solution polymerization or bulk polymerization through a volatile component separator comprising vertical foaming preheaters and vacuum vessels directly connected therewith and thereby removing volatile components continuously from the polymerization fluid composition in three stages to obtain a polymer composition having low volatile content, the process being characterized in that each of the three stages includes at least one vertical foaming preheater and one vacuum vessel, the first stage is carried out under such pressure and temperature conditions that the polymerization fluid composition leaving this stage contains said styrene polymer in an amount of 60 to 80% by weight and the temperature of the polymerization fluid composition passing through this stage lies between 70° and 120° C., wherein the pressure within the vacuum vessel of said first stage is kept in the range of 80 to 300 Torr, the second stage is carried out in such a way that



the molten polymer composition leaving this stage has a volatile content of 0.3 to 1% by weight, and can retain good fluidity, the temperature of the polymerization fluid composition heated in the preheater of this stage lies between 160° and 250° C., and the pressure within the vacuum vessel of this stage is kept in the range of 30 to 100 Torr, and the third stage is carried out in such a way that the temperature of the molten polymer composition heated in the preheater of this stage lies between 190° and 260° C. and devolatilization is effected at a pressure of 50 Torr or less in the presence of a highly volatile foaming agent.

4,537,955

UNSYMMETRICAL 1:2 CHROMIUM COMPLEX OF A MONOAZO DYESTUFF AND A DISAZO DYESTUFF WHICH IS NON-FIBER REACTIVE AND CONTAINS NO SULFONAMIDO OR AMINO GROUPS

Klaus Grychtol, Bad Durkheim, and Hans Baumann, Wachenheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

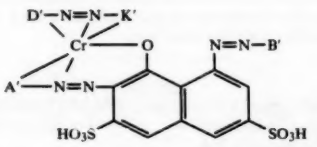
Filed Mar. 1, 1983, Ser. No. 470,943

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1982, 3207331

Int. Cl.³ C09B *45/06, 45/16, 45/26;* **D06P** *1/10*

U.S. Cl. 534—696 **2 Claims**

1. An unsymmetrical 1:2 chromium complex of a monoazo dyestuff and a disazo dyestuff which is non-fiber reactive and is free of sulfonamido and amino groups, and which, in the form of the free acid, has the formula



wherein A′ is the radical of a 1-hydroxy-2-aminobenzene substituted by nitro, sulfo or a mixture thereof, B′ is the radical of β-naphthol, K′ is unsubstituted or sulfo-substituted 1- or 2-naphthol and D′ is the radical of 1-hydroxy-2-aminobenzene or

1-amino-2-naphthol substituted by nitro, sulfo or a mixture thereof.

4,537,956

ANTIBIOTICS X-14889 A, C AND D

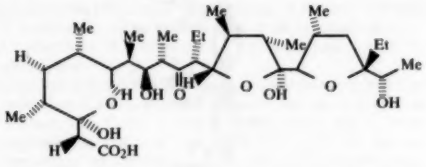
Chao-Min Liu, and John Westley, both of Cedar Grove, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Nov. 23, 1983, Ser. No. 554,506

Int. Cl.³ C07H *3/00*

U.S. Cl. 536—1.1 **3 Claims**

1. A compound of the formula



and the pharmaceutically acceptable salts thereof.

4,537,957

PROCESS FOR THE PRODUCTION OF MYCAMINOSYLTYLONOLIDE

Richard H. Baltz; Gene M. Wild, both of Indianapolis, Ind., and Eugene T. Seno, Norwich, England, assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 260,961, May 6, 1981, Pat. No. 4,419,447, which is a division of Ser. No. 156,854, Jun. 12, 1980, Pat. No. 4,321,361. This application Jun. 13, 1983, Ser. No. 503,986

Int. Cl.³ C07H *17/08;* **C12P** *19/62*

U.S. Cl. 336—7.1 **4 Claims**

1. The process for preparing 5-O-mycaminosyltylonolide which comprises treating 23-demycinosyltylosin at a temperature of about 20° C. to about 100° C. with a mild acid solution until 5-O-mycaminosyltylonolide is formed.

4,537,958

PROCESS FOR PREPARING CELLULOSE ETHERS

Carl P. Strange, Walker; Harold B. Martin, Jr., Plaquemine, and Albert C. Tsang, Baton Rouge, all of La., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 29, 1984, Ser. No. 626,513

Int. Cl.³ C08B *11/20, 11/22*

U.S. Cl. 536—85 **8 Claims**

1. A process for purifying a crude non-gelling water-soluble cellulose ether comprising (a) mixing under high agitation, a crude non-gelling water-soluble cellulose ether prepared in a dry process, or in a slurry in a liquid organic diluent, wherein substantially all of the diluent has been removed; with from about 1 to about 5 percent by weight of said cellulose ether of a dialdehyde under acidic conditions, whereby the cellulose ether is rendered substantially water-insoluble, (b) forming an aqueous slurry of the crosslinked cellulose ether, (c) transferring said slurry to a filter by means of a slurry pump such that substantially none of the cellulose ether becomes dissolved in the water and (d) dewatering said slurry on a filter to remove water-soluble impurities therefrom.

4,537,959

CRYSTALLINE CEPHALOSPORIN ANTIBIOTIC SALT

Ta-Sen Chou, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Mar. 26, 1984, Ser. No. 593,441

Int. Cl.³ C07D *501/38;* **A61K** *31/545*

U.S. Cl. 544—025 **1 Claim**

1. The α-monohydrate crystalline form of ceftazidime bishydrobromide having the following X-ray diffraction pattern:

d	I/I_1
14.85	.17
10.65	.50
9.94	.08
8.08	.29
7.66	.29
6.71	.25b
5.74	.38
5.37	.04
5.16	.04
4.77	.25
4.37	.83
4.22	1.00
4.04	.04
3.89	1.00
3.78	.17
3.56	.17
3.35	.21
3.29	.25
3.11	.25
2.93	.29
2.88	.25
2.79	.08
2.74	.17
2.70	.04
2.58	.08
2.54	.13
2.45	.13
2.24	.17
2.14	.08
2.09	.08

4,537,960

PREPARATION OF CARBAMATES

Franz Merger, Frankenthal; Gerhard Nestler, and Friedrich Towae, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

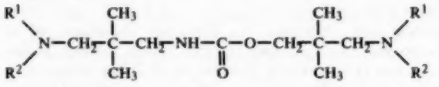
Filed Sep. 2, 1983, Ser. No. 529,037

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1982, 2033310

Int. Cl.³ C07C *125/065;* **C07D** *265/30, 295/14*

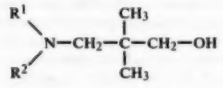
U.S. Cl. 544—86 **11 Claims**

1. A process for the preparation of an N- and O-substituted carbamate of the formula



I

where the individual radicals R^1 and R^2 are identical or different and are each an aliphatic, cycloaliphatic or araliphatic radical, or R^1 and R^2, together with the adjacent nitrogen atom, can furthermore form a heterocyclic ring, wherein urea is reacted with an aminopropanol of the formula



II

where R^1 and R^2 have the above meanings, at 140° C. or above.

4,537,961
CATALYTIC CYCLOTRIMERIZATION OF POLYISOCYANATES

Jean Robin, Lyons, France, assignor to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed Mar. 1, 1983, Ser. No. 470,988

Claims priority, application France, Mar. 4, 1982, 82 03799

Int. Cl.[3] **C07D** *251/34;* **C08G** *18/02;* **C08F** *4/16*

U.S. Cl. 544—193 **11 Claims**

1. A process for the preparation of a polyisocyanato-polyisocyanurate, comprising catalytically cyclotrimerizing an aliphatic or cycloaliphatic polyisocyanate in the presence of a catalytically effective amount of an aminosilyl catalyst, and further comprising terminating the cyclotrimerization reaction when a predetermined desired amount of isocyanurate groups has been attained, by adding to the reaction mixture a reaction terminating amount of an organic catalyst deactivating compound comprising at least one free hydroxyl moiety, or the reaction product of such hydroxylated organic catalyst deactivating compound with an isocyanate.

4,537,962
SUBSTITUTED 1,3,4-THIADIAZOLO[3,2-A]PYRIMIDINES AND COMPOSITIONS CONTAINING THEM

Gianfederico Doria, Milan; Carlo Passarotti, Gallarate, and Ada Buttinoni, Milan, all of Italy, assignors to Farmitalia Carlo Erba, S.p.A., Milan, Italy

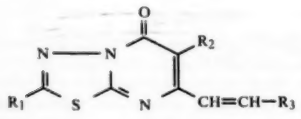
Filed Jan. 19, 1983, Ser. No. 459,188

Claims priority, application United Kingdom, Feb. 4, 1982, 8203238

Int. Cl.[3] **C07D** *239/00;* **A61K** *31/495*

U.S. Cl. 544—255 **3 Claims**

1. A compound of formula (I)



(I)

wherein

R_1 is

(a) hydrogen or halogen;

(b) a C_1–C_6 alkyl group, unsubstituted or substituted by C_1–C_4 alkoxy or by halogen;

(c) a phenyl ring unsubstituted or substituted by a group chosen from halogen, C_1–C_4 alkyl and C_1–C_4 alkoxy;

(d) a C_1–C_6 alkylthio group;

R_2 is hydrogen or halogen;

R_3 is 2-pyridyl, 3-pyridyl or 4-pyridyl, wherein each pyridyl group is unsubstituted or substituted by C_1–C_4 alkyl; and the pharmaceutically acceptable salts thereof.

4,537,963
INTERMEDIATES FOR OCTAHYDROBENZOFURO[3,2-E]ISOQUINOLINES

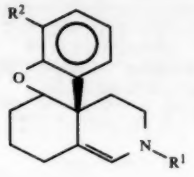
Ashokkumar B. Shenvi, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 334,839, Dec. 28, 1981, Pat. No. 4,421,916. This application Aug. 11, 1983, Ser. No. 522,094

Int. Cl.[3] **C07D** *491/048*

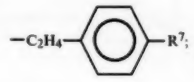
U.S. Cl. 546—66 **1 Claim**

1. The compound, Compound XI, having the formula:



wherein

R^1 is C_{1-10} alkyl, $-CH_2R^6$ or



R_2 is —H or —OH;

R^6 is C_{3-6} cycloalkyl, phenyl or 2-tetrahydrofuryl optionally substituted with a methyl group; and

R^7 is —H or C_{1-3} alkyl.

4,537,964
METHOD OF PREPARING PERMISSIBLY-SUBSTITUTED 1H(AND 2H)PYRAZOLO[3,4-G]QUINOLINES; PYRIMIDO[4,5,G]QUINOLINES; THIAZOLO[4,5,G]QUINOLINES AND INTERMEDIATES THEREFORE

John M. Schaus, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

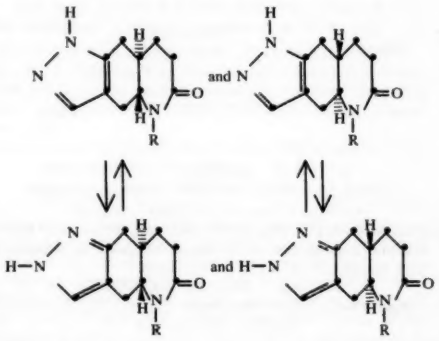
Filed Aug. 3, 1984, Ser. No. 637,665

The portion of the term of this patent subsequent to Aug. 27, 2002, has been disclaimed.

Int. Cl.[3] **C07D** *255/04, 273/01, 285/00*

U.S. Cl. 544—250 **29 Claims**

1. The trans-(±)-tautomers composed of the tautomeric enantiomers



wherein R is H, allyl or C_{1-3} straight-chain alkyl.

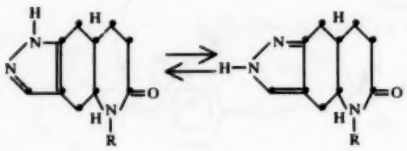
4,537,965

METHOD OF PREPARING 4AR,8AR-5-PERMISSIBLY SUBSTITUTED-6-OXO-OCTAHYDRO-1H(AND 2H)-PYRAZOLO[3,4-G]QUINOLINES, USEFUL AS INTERMEDIATES

Nancy G. Gallick-Whitaker, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Aug. 3, 1984, Ser. No. 637,354
Int. Cl.³ C07D *471/12*
U.S. Cl. 546—82 **3 Claims**

1. A tautomeric pair of the formula



wherein R is H, C_{1-3} straight-chain alkyl or allyl, and pharmaceutically acceptable acid addition salts thereof.

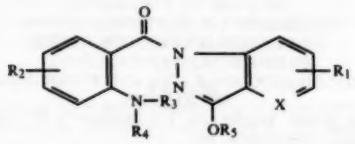
4,537,966

1-(AMINOBENZOYL)-1H-INDAZOL-3-OLS

Robert J. Murray, Penfield, N.Y., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Dec. 22, 1983, Ser. No. 564,540
Int. Cl.³ C07D *231/56, 471/04*
U.S. Cl. 546—120 **18 Claims**

1. An aminobenzoyl-1H-indazole-3-ol having the formula:



in which R_1 and R_2 are independently selected from the group consisting of H, lower alkyl, lower alkoxy, hydroxy, amino, nitro, and halogen,

R_3 is selected from the group consisting of H, lower alkyl, cycloalkyl having 3 to about 7 carbons, phenyl, phenyl which is mono- or disubstituted with lower aryl or trifluoromethyl, and benzyl,

R_4 is H and R_5 is selected from H and lower alkyl, and

X is CH or N, or a pharmacologically acceptable salt thereof.

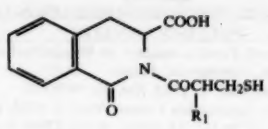
4,537,967

1-OXO-1,2,3,4-TETRAHYDRO-3-ISOQUINOLINE CARBOXYLIC ACID DERIVATIVES

Keohei Nozawa, Ohi; Toyokichi Yoshizawa, Isehara, and Toshio Kureda, Sagamihara, all of Japan, assignors to Wakamoto Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Jul. 1, 1983, Ser. No. 510,227
Claims priority, application Japan, Jul. 8, 1982, 57-117817
Int. Cl.³ C07D *217/24*
U.S. Cl. 546—141 **3 Claims**

1. A compound of the following general formula [I]:



[I]

wherein R_1 represents a hydrogen atom or a lower alkyl group,

and pharmaceutically acceptable salts thereof.

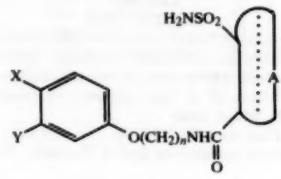
4,537,968

THIOPHENE DERIVATIVES WITH ANTISECRETORY ACTIVITY

Anthony C. Scotese, King of Prussia; Robert L. Morris, Devon; Arthur A. Santilli, Havertown, and Donald P. Strike, St. Davids, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Dec. 21, 1983, Ser. No. 564,440
Int. Cl.³ C07D *413/12, 333/36, 417/12*
U.S. Cl. 546—209 **2 Claims**

1. A compound having the formula:

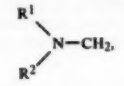


wherein

A is

R is mono- or dihalo, amino, nitro, cyano, hydroxy, trifluoromethyl, mercapto, lower alkyl, lower alkoxy, alkanoyl of 2–5 carbon atoms, cycloalkyl of 5–7 carbon atoms, carboxy, alkoxycarbonyl of 2–7 carbon atoms, mono- or di-lower alkyl substituted amino, alkanoylamino of 2–5 carbon atoms, lower alkyl thio, loweralkyl-sulfonyl, sulfamoyl, lower alkyl substituted sulfamoyl, phenyl or phenyl substituted with halo, lower alkyl, lower alkoxy, trifluoromethyl, hydroxy, amino, cyano or nitro;

X and Y are each, independently, hydrogen or



wherein

R^1 is hydrogen or lower alkyl;

R^2 is hydrogen or lower alkyl; or

R^1 and R^2 taken together form a heterocyclic moiety selected from 1-pyrrolidinyl, 1-piperidinyl, 1-hexahydroazepinyl, 1-octahydroazocinyl, 3, tetrahydrothiazolyl, 4-morpholinyl or 4-thiomorpholinyl, with the proviso that one of X and Y is always hydrogen;

n is 1–4;

and the pharmacologically acceptable salts thereof.

2. The compound of claim 1, which is 4-(aminosulfonyl)-N-

[3-[3-(1-piperidinylmethyl)phenoxy]-propyl]-3-thiophenecarboxamide.

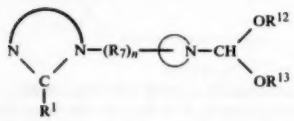
4,537,969

IMIDAZOLE DERIVATIVES

Chung-Chen Wei, Cedar Knolls, and Manfred Weigele, North Caldwell, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 359,326, Mar. 18, 1982, Pat. No. 4,431,653. This application Jan. 5, 1984, Ser. No. 568,329
Int. Cl.[3] C07D *277/08;* A61K *31/415*
U.S. Cl. 546—210 6 Claims

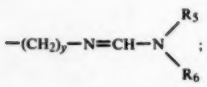
1. A compound of the formula



wherein n is an integer from 0 to 1;

is a saturated 5 to 7 membered heterocyclic ring containing the nitrogen as the only hetero atom in said ring, said ring being unsubstituted or substituted in one or more positions with lower alkyl;

is a 5 membered heterocyclic ring having at most one additional nitrogen atom as the only hetero atom, from 0 to 2 additional double bonds, and, aside from R, either beingunsubstituted or substituted in one or more positions with lower alkyl; R is selected from the group consisting of lower alkyl, nitro, hydrogen, —COOH, $-(CH_2)_y-NHR_4$, $-(CH_2)_yOR_3$ and



R_3 is hydrogen or lower alkyl, y is an integer from 0 to 4; R_4 is lower alkyl or an amino protecting group, R_5 and R_6 are lower alkyl or one of R_5 or R_6 is hydrogen and the other is an amino protecting group or lower alkyl; R_{12} and R_{13} are lower alkyl or taken together form $-CH_2-(CH_2)_x-CH_2$; x is an integer from 0 to 2; and R_7 is lower alkylene.

4,537,970

PROCESS FOR THE PREPARATION OF ESTERS OR SALTS OF AROMATIC OR ETHEROAROMATIC ACIDS

Marco Foà ; Franco Francalanci, both of Novara; Andrea Gardano, Trino Vercellese, and Elena Bencini, Novara, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Dec. 12, 1983, Ser. No. 560,228
Claims priority, application Italy, Dec. 14, 1982, 24723 A/82
Int. Cl.[3] C07D *239/02;* C07C *67/36, 51/10*
U.S. Cl. 546—319 12 Claims

1. A process for the preparation of esters or salts of aromatic or etheroaromatic acids having formula (I):

$$Y—Ar—CO—OR \quad (I)$$

where:

Ar represents an aromatic group constituted by one or more benzene rings, optionally condensed or an etheroaromatic nucleus optionally condensed with one or more benzene rings;

Y represents from zero to more substituents, equal or different, chosen among a halogen; an alkyl group having up to 6 carbon atoms; an alkoxy group having up to 5 carbon atoms; an ester group —COOR′, where R′ contains up to 5 carbon atoms; a hydroxyl group; a phenyloxy group optionally substituted with groups inert under the reaction conditions; a trifluoromethyl group; a nitrile group; an amidic group ($-CONH_2$); an acetamidic group ($-NH-CO-CH_3$), or an acyl group —CO—R″, where R″ represents a hydrocarbon group having up to 8 carbon atoms;

R represents an alkyl group R_1 having up to 5 carbon atoms or an alkali metal or alkaline-earth metal M;

characterized in that a halide having formula (II)

$$Y—Ar—X \quad (II)$$

where Ar and Y have the hereinabove defined values, while X is Cl, Br or I, is made to react with carbon monoxide in an alcoholic solvent R_1OH (where R_1 is an alkyl group having up to 5 carbon atoms) at atmospheric pressure and at temperatures ranging between −10° and 60° C. in the presence of an acidity-acceptor compound and of a catalyst constituted by a cobalt complex having formula (III):

$$Z—Co(CO)_4 \quad (III)$$

where Z is a group chosen among CH_3; CH_2F; CHF_2; CF_3; $CH_2—CN$; $CH_2—COOR'''$, where R‴ is an alkyl group having up to 8 carbon atoms or a benzene group, the latter optionally substituted with groups inert under the reaction conditions; CH_2Ar', where Ar′ is an aromatic group constituted by from one to three benzene rings optionally condensed and optionally substituted with groups inert under reaction conditions, in particular with electron-attractor groups.

4,537,971

PROCESS FOR PREPARING QUINOLINIC ACID

Robert W. J. Rebhahn, West Chester, Ohio; James E. Kassner, Fort Mitchell, Ky., and Raymond E. Werner, Cincinnati, Ohio, assignors to The Hilton-Davis Chemical Co., Cincinnati, Ohio

Continuation of Ser. No. 261,254, May 6, 1981, abandoned. This application Sep. 26, 1983, Ser. No. 536,133
Int. Cl.[3] C07D *213/55*
U.S. Cl. 546—320 8 Claims

1. In a process wherein quinoline is oxidized in an initial step with hydrogen peroxide in an aqueous medium in the presence of sulfuric acid and copper sulfate to produce copper quinolinate and in subsequent steps, the copper quinolinate is treated with alkali to convert said copper quinolinate to its soluble alkali salt form which is removed from the insoluble cupric oxide and thereafter said soluble alkali salt form is treated with acid to produce quinolinic acid, the improvement whereby the reaction of the initial step is carried out in a thermally control-

lable and safe manner and the formation of by-products is minimized which comprises adding separately in said initial step in a portion-wise manner approximately fifteen to approximately twenty-five approximately equal portions of the reaction quantities of the sulfuric acid, the quinoline and the hydrogen peroxide either sequentially in that order or simultaneously at time intervals of sufficient length spaced between each group of portion-wise additions as to allow the hydrogen peroxide to react before the next addition to an unreacted hydrogen peroxide concentration in the reaction mixture of between approximately three and approximately fifteen percent.

4,537,972

2,4-DIAZABICYCLO[3.3.0]OCTANE-3,7-DIONES

Clifford J. Harris, Crown Close, Chelsfield, Orpington, and Paul Barraclough, 138 Postley Rd., Hayle Estate Maidstone, both of Kent, England

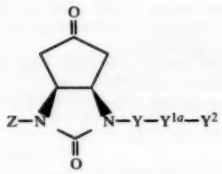
Division of Ser. No. 296,138, Aug. 25, 1981, Pat. No. 4,432,988. This application Nov. 30, 1983, Ser. No. 556,449

Claims priority, application United Kingdom, Aug. 26, 1980, 8027561

Int. Cl.[3] **C07D** *235/02*

U.S. Cl. 548—302 **3 Claims**

1. A compound of the formula



where Z is hydrogen or C_{1-4} straight chain or branched chain alkyl;

Y is $—CR_2—CH_2—$ in which each R is independently hydrogen or methyl;

Y^{1a} is methylene substituted by hydroxyl, methylene substituted by hydroxyl and C_{1-6} alkyl, methylene, methylene substituted by a protected hydroxyl, methylene substituted by a protected hydroxyl and a C_{1-6} alkyl group, or carbonyl and

Y^2 is C_{1-7} straight chain or branched alkyl, phenyl, benzyl or C_{4-7} cycloalkyl.

4,537,973

PROCESS FOR PREPARING BIOTIN

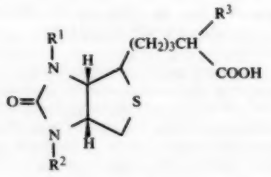
Takeo Takahashi, Takarazuka; Kozo Shimago, Osaka, and Kaoru Maeshima, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 129,732, Mar. 12, 1980, abandoned. This application Oct. 8, 1981, Ser. No. 309,765

Int. Cl.[3] **C07D** *495/04*

U.S. Cl. 548—303 **13 Claims**

1. A process for preparing biotin, comprising: heating a mixture of a compound of the formula:



wherein R^1 and R^2 are each hydrogen or benzyl and R^3 is hydrogen or carboxyl, with the proviso that R^1 and R^2 are not simultaneously hydrogen and a lower alkanesulfonic acid at a temperature of 80° to 180° to form biotin and separating biotin from said mixture.

4,537,974

DIETHYNYLATED PHENYLBENZIMIDAZOLE COMPOUNDS

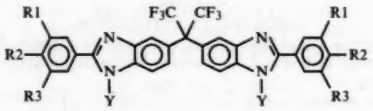
Kreisler S. Y. Lau, Alhambra, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Sep. 26, 1984, Ser. No. 655,009

Int. Cl.[3] **C07D** *235/04;* **C08F** *14/18*

U.S. Cl. 548—328 **17 Claims**

1. A diethynylated bisbenzimidazole monomer having the formula:



where Y is phenyl, cyclohexyl, adamantyl or phenoxylated-phenyl of the formula $C_6H_5(OC_6H_4)n$ (N=1 to 3) and where R1, R2 and R3 are ethynyl, phenoxyethynyl, phenylethynyl or hydrogen, and further wherein at least one of said R1, R2 or R3 is not hydrogen.

4,537,975

1-PHENYLINDAZOL-3-ONE COMPOUNDS

Henning Heinemann, Hanover, Fed. Rep. of Germany; Daniel Jasserand, Paris, France; Wolfgang Milkowski, Burgdorf, Fed. Rep. of Germany; Dimitri Yavordios, Chatillon-sur-Chalaronne, France, and Horst Zeugner, Hanover, Fed. Rep. of Germany, assignors to Kali-Chemie Pharma GmbH, Hanover, Fed. Rep. of Germany

Division of Ser. No. 409,632, Aug. 19, 1982, Pat. No. 4,448,777. This application Dec. 22, 1983, Ser. No. 564,398

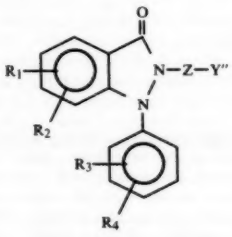
Claims priority, application Fed. Rep. of Germany, Aug. 20, 1981, 3132916

Int. Cl.[3] **C07D** *231/56, 403/06;* **A61K** *31/495*

U.S. Cl. 548—359 **6 Claims**

1. A compound of the formula II

II



where R_1 is a hydrogen or halogen atom, or a lower alkyl, lower alkoxy, or trifluoromethyl radical, R_2 is a hydrogen or halogen atom, or a lower alkyl or lower alkoxy radical, R_3 is a hydrogen or halogen atom, or a lower alkyl, lower alkoxy or trifluoromethyl radical, R_4 is a hydrogen or halogen atom, or a lower alkyl or lower alkoxy radical, Z is an alkylene radical with 2 to 6 carbon atoms and Y″ is a halogen atom, or a hydroxyl, lower alkanesulphonyl, benzenesulfonyl or benzenesulphonyl radical which is substituted in the benzene ring by a lower alkyl radical or a halogen atom, or an acid addition salt thereof, with the proviso that Y″ is other than chlorine if the substituents R_1, R_2, R_3, and R_4 each are hydrogen and Z is an ethylene or propylene group.

4,537,976
BENZO[B]THIOPHENES

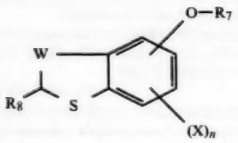
Helen H. Ong, Whippany, N.J., and James A. Profitt, Goshen, Ind., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Division of Ser. No. 256,470, Apr. 4, 1981, Pat. No. 4,436,748, which is a continuation-in-part of Ser. No. 198,736, Oct. 20, 1980, abandoned. This application Dec. 5, 1983, Ser. No. 558,074

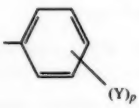
Int. Cl.³ C07D *333/64*

U.S. Cl. 549—54 **19 Claims**

1. The compound of the formula

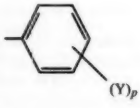


wherein R_1 is lower alkyl; R_8 is hydrogen, lower alkyl, lower cycloalkyl or a group of the formula



wherein Y is hydrogen, halogen, lower alkyl, lower alkoxy or hydroxy and p is 1 or 2; W is a carbonyl or a group of the formula

wherein R_9 is hydrogen, lower alkyl, lower cycloalkyl or a group of the formula



wherein Y and p are as above; X is hydrogen, halogen or lower alkyl; and n is 1 or 2; or the tautomer thereof when W is carbonyl and the geometric isomers thereof when it is other than carbonyl.

4,537,977
TETRASUBSTITUTED PHTHALIC ACID DERIVATIVES, AND A PROCESS FOR THEIR PREPARATION

Walter Fischer, Reinach, and Hans Zweifel, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

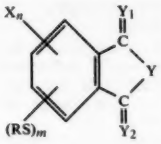
Division of Ser. No. 363,188, Mar. 29, 1982, Pat. No. 4,459,414. This application Apr. 4, 1984, Ser. No. 596,865

Claims priority, application Switzerland, Apr. 8, 1981, 2364/81

Int. Cl.³ C07D *307/89*

U.S. Cl. 549—243 **9 Claims**

1. A compound of the formula I



(I)

in which m is an integer from 1 to 4, n is 0, 1, 2 or 3 and the sum of m+n is 4, Y_1 and Y_2 are oxygen and Y is —O—, X is chlorine or bromine, and the group R is, or in the case where m>1 the groups R independently of one another are, straight-chain C_{1-12}-alkyl, 2-hydroxyethyl, phenyl, p-tolyl, 2-, 3- or 4-methoxyphenyl, 4-chlorophenyl, 2,5-dichlorophenyl, 4-nitrophenyl, 4-acetylaminophenyl, 2- or 4-aminophenyl, 4-hydroxyphenyl or $—CH_2CH_2C_pF_{2p+1}$ with p=6, 8 or 10, with the proviso that when m is the integer 1, the group —SR is bonded in the 4-position; and when m is the integer 2, the groups —SR are bonded in the 4,5-positions and the groups R are both identical.

4,537,978
PROCESS FOR THE PRODUCTION OF TRIMELLITIC ANHYDRIDE

Peter H. Kilner, Chicago; Joseph P. Egan, Jr., Plainfield; Stephen G. Ceisel, Shorewood, and Wayne P. Schammel, Bartlett, all of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Mar. 20, 1984, Ser. No. 591,468

Int. Cl.³ C07D *307/89*

U.S. Cl. 549—245 **13 Claims**

1. A process for oxidizing pseudocumene to trimellitic anhydride which comprises catalytic oxidation of pseudocumene with air in the presence of acetic acid in an oxidation zone wherein liquid-phase conditions are maintained and wherein the weight ratio of acetic acid to pseudocumene is in the range of about 1.0–2.5:1.0 and the catalyst comprises one or more heavy metal oxidation catalysts comprising zirconium, cobalt and manganese to provide about 0.2 to about 0.4 weight percent total metals based on pseudocumene and a source of bromine, to provide a total of about 0.10 to about 0.30 weight percent total bromine based on pseudocumene, wherein the total weight ratio of bromide ions to total metals ions is about 0.7 to about 2.0 and the zirconium content is about 1 to about 5% and the manganese content is about 14 to about 24% each metal by weight of the total metals and wherein the cobalt content is about 60 to about 70 weight percent and the temperature in the last stage is upward from about 175° C. to about 225° C. and the temperature in the preceding stage is between about 125° C. and about 165° C. and wherein acetic acid solvent and water of reaction are withdrawn during the last 5 to about 20% of the oxidation reaction.

4,537,979
ALPHA-SUBSTITUTED-ALKYLARYLKETALS PARTICULARLY USEFUL FOR PREPARING ALPHA-ARYLALKANOIC ACIDS

Graziano Castaldi, Briona, and Claudio Giordano, Vicenza, both of Italy, assignors to Zambon S.p.A., Vicenza, Italy

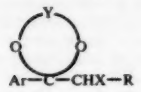
Filed Aug. 3, 1983, Ser. No. 520,130

Claims priority, application Italy, Mar. 7, 1983, 19930 A/83

Int. Cl.³ C07D *321/00*

U.S. Cl. 549—347 **2 Claims**

1. A compound of formula



(I)

wherein

Ar is a phenyl ring substituted by one or two substituents selected from halogen, 1–6 C alkyl, 1–4 C alkoxy, 2–4 C alkenyloxy or a naphthyl ring substituted by one or two substituents selected from halogen and 1–4 C alkoxy;

X is OR_3 in which R_3 is H, acyl or aroyl, $OSO_2—CH_3$ or $OSO_2—C_6H_4—CH_3$;

R is H or an alkyl having from 1to 3 C atoms;

and Y is $—CH_2—C(R_1)=C(R_2)—CH_2—$ in which R_1 and R_2 are H or CH_3.

4,537,980

ACETALS

James N. Greenshields, Stockport, England, assignor to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 140,599, Apr. 15, 1980, Pat. No. 4,459,418. This application Dec. 23, 1983, Ser. No. 564,900

Claims priority, application United Kingdom, May 2, 1979, 7915225

Int. Cl.³ C07D *407/00, 319/06, 17/00*

U.S. Cl. 549—370 **4 Claims**

1. An acetal having a color not exceeding 250 Hazen units derived from a polyol containing at least four hydroxyl groups and a fatty aliphatic aldehyde having an alkyl chain containing at least 11 and up to 20 carbon atoms.

4,537,981

7-OXABICYCLOHEPTANE AND 7-OXABICYCLOHEPTENE COMPOUNDS

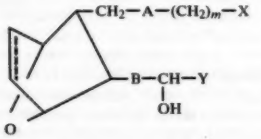
David L. Snitman, Boulder, Colo.; Martin F. Haslanger, Lambertville, and Peter W. Sprague, Pennington, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 319,511, Nov. 9, 1981, abandoned. This application May 17, 1982, Ser. No. 378,547

Int. Cl.³ C07D *493/08*

U.S. Cl. 549—463 **27 Claims**

1. A compound having the structural formula



and including all stereoisomers thereof;

wherein A and B may be the same or different and A is CH=CH or $(CH_2)_2$,

B is CH=CH, C≡C, or $(CH_2)_2$; m is 1 to 8;

X is CO_2R^1 wherein R^1 is H or lower alkyl;

Y is aryl-lower alkyl; alkenyl containing 3 to 6 carbons; alkynyl containing 3 to 6 carbons; cycloalkyl; substituted cycloalkyl, cycloalkylalkyl, substituted cycloalkylalkyl or phenoxymethyl; wherein alkyl or lower alkyl by itself or as part of another group contains 1 to 12 carbons and may include as substituents halo, lower alkoxy, alkyl-aryl, haloalkyl, cycloalkyl or alkylcycloalkyl; cycloalkyl by itself or as part of another group contains 3 to 12 carbons in the ring portion, and may include as substituents 1 or 2 halogens, 1 or 2 lower alkyl groups or 1 or 2 lower alkoxy groups; aryl by itself or as part of another group refers to a monocyclic or bicyclic aromatic ring which contains 6 to 10 carbons in the ring portion, which may include as a substituent lower alkyl, halogen or lower alkoxy, which substituents will not be adjacent sterically hindered groups;

and represents a single bond or double bond, with the proviso that where represents a double bond, A is CH=CH and B is CH=CH or $(CH_2)_2$ and Y is other than alkenyl or alkynyl.

4,537,982

PRODUCTION OF ORGANIC NICKEL COMPOUNDS

Karl-Heinz A. O. Starzewski, Frankfurt am Main, and Josef Witte, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

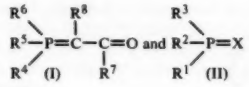
Filed Jul. 22, 1983, Ser. No. 516,104

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1982, 3228865; May 17, 1983, 3317825; Jun. 11, 1983, 3321179

Int. Cl.³ C07F *15/04*

U.S. Cl. 556—22 **6 Claims**

1. Nickel compounds producible by reacting a nickel-(O)-compound or a nickel compound convertible thereto in situ with two different compounds corresponding to the following general formulae



(I) (II)

wherein

R^1, R^2 and R^3, which may be the same or different, represent optionally by halogen, hydroxy, C_1–C_{20}-alkoxy or C_6–C_{12}-aryloxy substituted C_1–C_{20}-alkyl radicals, C_6–C_{12}-aryl radicals or C_3–C_8-cycloalkyl radicals; C_6–C_{12}-aryl-C_1–C_{20}-alkyl radicals, C_1–C_{20}-alkyl-C_6–C_{12}-aryl radicals, C_1–C_{20}-alkyl-C_3–C_8-cycloalkyl radicals, C_6–C_{12}-aryl-C_3–C_8-cycloalkyl radicals C_2–C_6-alkenyl radicals, C_6–C_{12}-aryl-C_2–C_6-alkenyl radicals, di-C_1–C_4-alkylamino radicals and optionally substituted phenoxy and alkoxy radicals X denotes O, NR^9 or

R^4, R^5, R^6, R^7 and R^8, which may be the same or different, represent optionally by halogen, hydroxy, C_1–C_{20}-alkoxy or C_6–C_{12}-aryloxy substituted C_1–C_{20}-alkyl radicals, C_6–C_{12}-aryl radicals, C_2–C_{30}-alkenyl radicals or C_3–C_8-cycloalkyl radicals; C_6–C_{12}-aryl-C_1–C_{20}-alkyl radicals, C_1–C_{20}-alkyl-C_6–C_{12}-aryl radicals halogen, hydroxy, C_1–C_{20}-alkoxy radicals, or C_6–C_{12}-aryloxy radicals, in addition to which

R^7 may represent hydrogen,

R^8 may represent hydrogen or sulphonate and

R^9, R^{10} and R^{11}, which may be the same or different represent hydrogen, silyl, halogen, nitrophenyl, cyano or R^1.

4,537,983

METHOD OF PREPARING 2-PHENYLETHYLCHLOROSILANES

Claus-Dietrich Seiler, Rheinfelden, and Hans-Joachim Vahlensieck, Wehr, both of Fed. Rep. of Germany, assignors to Dynamit Nobel AG, Cologne, Fed. Rep. of Germany

Filed Aug. 27, 1984, Ser. No. 644,808

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1983, 3331682

Int. Cl.³ C07F *7/08*

U.S. Cl. 556—479 **10 Claims**

1. method of preparing 2-phenylethyl chlorosilanes by the addition of hydrogen chlorosilane onto styrene in homogene-

ous systems in the presence of platinum catalysts, comprising conducting the addition reaction in the presence of benzothiazole.

4,537,984

PROCESS FOR PRODUCING 2-(4-HYDROXYPHENOXY) PROPIONATE DERIVATIVES

Isao Hashiba; Tadashi Nishikimi, and Shuji Tsuchiya, all of Funabashi, Japan, assignors to Nissan Chemical Industries Ltd., Tokyo, Japan

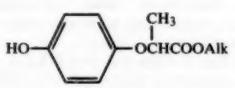
Filed Apr. 26, 1984, Ser. No. 604,156

Claims priority, application Japan, May 19, 1983, 58-88097; Oct. 8, 1983, 58-188889

Int. Cl.³ C07C *69/76*

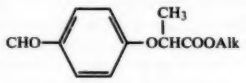
U.S. Cl. 560—061 **2 Claims**

1. A process for producing a 2-(4-hydroxyphenoxy)propionate derivative represented by the formula:



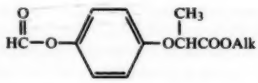
(I)

where Alk is a C_1–C_5 alkyl group, which comprises reacting a phenoxy propionate derivative represented by the formula:



(II)

where Alk is as defined above, with a peroxide to obtain a formate derivative represented by the formula:



(III)

where Alk is as defined above, and hydrolyzing the formate of the formula III.

4,537,985

PROCESS FOR THE MANUFACTURE OF 1,4-BIS[2-(4'-CARBOMETHOXYSTYRENYL)] BENZENE

Imre Puskas, Wheaton, and Marshall Schmitt, Chicago, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 369,035, Apr. 16, 1982, abandoned. This application Jul. 18, 1983, Ser. No. 514,681

Int. Cl.³ C07C *67/00*; C07F *9/54*

U.S. Cl. 560—96 **11 Claims**

1. A process for the manufacture of 1,4-bis-[2-(4'-carbomethoxystyrenyl)]benzene which comprises reacting, at a temperature of about 0° C. to about 100° C., in a highly polar anhydrous organic solvent or solvent mixture, or in liquid ammonia a p-xylylene-bis—(trialkylphosphonium halide) or a p-xylylene-bis—(triarylphosphonium halide) with 4-carbomethoxybenzaldehyde, initiated by the slow introduction of an organometallic base or an inorganic base.

7. A process for the preparation of p-xylene-bis(triphenylphosphonium chloride) wherein alpha, alpha'-dichloro-p-xylene and triphenyl phosphine are reacted in about 1:2 molar ratio without a solvent at a temperature of about 140° C. to about 200° C.

4,537,986

PREPARATION OF PYROCATECHOL METHYLCARBAMATE

Gernot Reissenweber, Boehl-Iggelheim; Siegfried Kersten, Frankenthal; Walter Ditter, Heidelberg, and Peter Jacobs, Gruenstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 27, 1983, Ser. No. 517,625

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1982, 3227931

Int. Cl.³ C07C *125/067*

U.S. Cl. 560—132 **4 Claims**

1. A process for the preparation of pyrocatechol methylcarbamate by reacting pyrocatechol carbonate with methylamine, wherein the reaction is carried out in the presence of 0.2 to 1.4 moles of a free tertiary amine, per mole of carbonate.

4,537,987

PREPARATION OF PURE MONOESTERS OF ADIPIC ACID

Heinz-Walter Schneider; Wolfgang Richter, both of Ludwigshafen; Walter Disteldorf, Wachenheim, and Rudolf Kummer, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 11, 1984, Ser. No. 629,766

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1983, 3325372

Int. Cl.³ C07C *67/38*

U.S. Cl. 560—193 **5 Claims**

1. A process for the preparation of a pure monoester of adipic acid, wherein

(a) a pentenoate is reacted with carbon monoxide and hydrogen at from 90° to 140° C. and under from 5 to 300 bar in the presence of a carbonyl complex of cobalt or of rhodium, said pentenoate being an alkyl ester of 1–12 carbon atoms, a cycloalkyl ester of 5–12 carbon atoms, an alkaryl ester of 7–9 carbon atoms or a phenyl ester, and a 5-formylvalerate is separated off, and

(b) the 5-formylvalerate thus obtained is oxidized with molecular oxygen, or with a gas containing this, at from 20° to 100° C. under from 1 to 10 bar.

4,537,988

PROCESS FOR THE PREPARATION OF 2-(4-HYDROXYPHENYL)-3-METHYLBUTYRIC ACID

Charles P. Grasso, Princeton, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Jun. 6, 1983, Ser. No. 501,337

Int. Cl.³ C07C *65/01*

U.S. Cl. 562—478 **2 Claims**

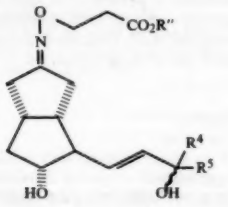
1. A process for the preparation of 2-(4-hydroxyphenyl)-3-methylbutyric acid comprising: hydrolyzing 2-(4-chlorophenyl-3-methylbutyronitrile with a concentrated aqueous solution of an alkali metal hydroxide selected from 50 to 80% by weight of aqueous sodium or potassium hydroxide at a temperature from 140° to 200° C. for a period of time from one to ten hours or until the reaction is essentially complete, to the corresponding 2-(4-chlorophenyl)-3-methylbutyric acid, introducing into the reaction mixture an aqueous solution of 2 to 10 molar percent of a cupric salt selected from cupric chloride or cupric sulfate and displacing the halide with hydroxide at a temperature of 190° to 250° C. at a superatmospheric pressure of 2 to 25 kg cm^{-2} for 1 to 20 hours, or until the reaction is essentially complete.

4,537,989
IMINO-BICYCLO (3.3.0) OCTANE DERIVATIVES

Keiichi Ono, Osaka; Akihiko Sugie; Masami Muraoka, both of Toyonaka, and Michihiro Yamamoto, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Apr. 15, 1983, Ser. No. 485,587
Claims priority, application Japan, Apr. 26, 1982, 57-71071
Int. Cl.³ C07C *131/02*; A61K *31/19, 31/195, 31/215*
U.S. Cl. 562—501 5 Claims

1. A compound of the formula

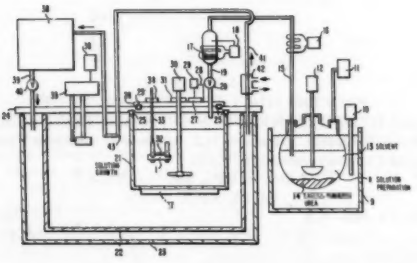


wherein R″ is a hydrogen atom or a C_1–C_4 alkyl group, and R^4 is a hydrogen atom or a C_1–C_4 alkyl group, R^5 is a hydrogen atom, a C_3–C_8 alkynyl group, a C_3–C_8 alkenyl group, a C_1–C_8 alkyl group, a C_3–C_7 cycloalkyl group, a hydroxy C_1–C_8 alkyl group or a group of the formula: $-(CH_2)_m$-B (m is 1 or 2 and B is a C_1–C_4 alkoxy, a C_3–C_7 cycloalkyl, or a phenyl or phenoxy group optionally substituted with a halogen atom, a C_1–C_4 alkyl group, a trifluoromethyl group or a C_1–C_4 alkoxy group).

4,537,990
METHOD FOR GROWING SINGLE CRYSTALS OF UREA

William R. Donaldson, and Chung L. Tang, both of Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Mar. 24, 1983, Ser. No. 478,601
Int. Cl.³ C30B *7/08*
U.S. Cl. 564—63 2 Claims



1. A process for growing single urea crystals having an altered crystal habit with significant dimensions on the 110 and 110 faces which comprises growing a urea crystal upon a seed crystal from an alcoholic solution of urea containing a crystal quality enhancing amount of ammonium bromide less than an amount which would saturate the crystal growth solution at the lowest crystal growth temperature employed while covering the ends of the growing crystal along the Z axis throughout the crystal growth process to prevent growth of the crystal along the Z axis, thereby providing a urea crystal adapted for laser use.

4,537,991
PROCESS FOR THE DIRECT ACETYLATION OF AROMATIC AMINES

Ellis Margaret D.; Richard L. Ferencz, both of Mount Pleasant, and Dietmar Kalz, Summerville, all of S.C., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Nov. 30, 1983, Ser. No. 556,680
Int. Cl.³ C07C *103/127, 102/00*
U.S. Cl. 564—133 9 Claims

1. A process for the acetylation of solid aromatic amines comprising contacting an aromatic amine in flowable particulate form with liquid acetic anhydride under agitation conditions sufficient to prevent the aggolomeration of the particles and then evaporating any unreacted acetic anhydride and the acetic acid by-product without melting the acetylated amine.

4,537,992
METHOD FOR REMOVAL OF NITROSOAMINE IMPURITIES FROM HERBICIDES

Michael Pikarski, Ramat-Gen; Julian Gabe, Rehovoth, and Edmund Dykman, Ashdod, all of Israel, assignors to Agan Chemical Manufacturers, Ltd., Israel

Filed Feb. 9, 1984, Ser. No. 578,518
Claims priority, application Israel, Feb. 18, 1983, 67948
Int. Cl.³ C07C *87/60, 111/00*
U.S. Cl. 564—437 12 Claims

1. A method for removal of nitrosoamine impurities from herbicides comprising contacting a nitrosoamine containing herbicide homogeneously with 0.001% to 1.0% of a compound having the formula:

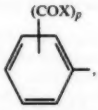
where

X equals chlorine or bromine,

R^1 equals lower alkyl, and

a equals zero or 1; provided that when a equals 1, then:

R equals $X_nH_{(3-n)}C(CH_2)_p$—, or



or R^2COX, where R^2 is selected from alkylene, alkenylene, alkynylene groups having 1 to 5 carbon atoms,

n equals 1 to 3, and

p equals zero, 1 or 2; and provided that when a equals zero, then:

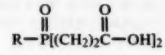
R equals aminophenyl, for a sufficient length of time to remove at least a substantial amount of the nitrosoamine.

4,537,993
BIS(β-CARBOXYETHYL)ISOBUTYL, SEC. BUTYL AND T-BUTYL PHOSPHINE OXIDE AND POLYAMIDES CONTAINING THE SAME

Christos Savides, Fairfield, Conn., and Allan J. Robertson, Thorold, Canada, assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 591,287, Mar. 19, 1984, abandoned. This application Jun. 18, 1984, Ser. No. 621,760
Int. Cl.³ C07F *9/53*
U.S. Cl. 568—14 4 Claims

1. A compound having the formula:



wherein R is a secondary butyl radical, an isobutyl radical or a t-butyl radical.

4,537,994

SULFIDE METATHESIS

John S. Roberts, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 18, 1983, Ser. No. 542,960
Int. Cl.[3] C07C *149/10, 148/00*
U.S. Cl. 568—59 17 Claims

1. A process for the reaction of organosulfides with mercaptans which comprises:

contacting a feed consisting essentially of organosulfide and mercaptan in the presence of a catalyst which contains a reaction product of a Group III A component and a phospho Group VIB reactant under reaction conditions to exchange one organic moiety of the organosulfide with the hydrogen of the mercaptan.

15. A process for the reaction of organosulfides with mercaptans which comprises:

contacting an organosulfide with a mercaptan in the presence of a catalyst which contains a reaction product of a Group IIIA component and a phospho molybdic reactant under reaction conditions to exchange one organic moiety of the organosulfide with the hydrogen of the mercaptan.

16. A process for the reaction of organosulfides with mercaptans which comprises:

contacting an organosulfide with a mercaptan in the presence of a phospho Group VIB reactant on a support selected from the group consisting of metal aluminate and Group IIIA phosphate, under reaction conditions to exchange one organic moiety of the organosulfide with the hydrogen of the mercaptan.

17. A process for the reaction of organosulfides with mercaptans which comprises:

contacting di-n-propylsulfide with thiophenol in the presence of a catalyst which contains a reaction product of a Group IIIA component and a phospho Group VIB reactant under reaction conditions to exchange one organic moiety of the organosulfide with the hydrogen of the mercaptan.

4,537,995

ISOMERIZATION OF BRANCHED ALDEHYDES TO KETONES

H. Clay Linstid, III, Maplewood, and Gerald S. Koermer, Springfield, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Nov. 7, 1983, Ser. No. 549,129
Int. Cl.[3] C07C *45/67*
U.S. Cl. 568—384 6 Claims

1. A process for isomerizing branched aldehydes to ketones which comprises contacting a 2-alkyl substituted aldehyde with a ZSM-5 type crystalline aluminosilicate zeolite at a temperature from about 200° C. to about 600° C. in the presence of water in a molar ratio range from about 0.03 to about 20 moles of water per mole of aldehyde.

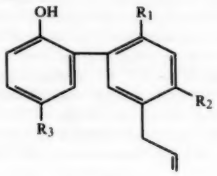
4,537,996

HYDROXYBIPHENYL COMPOUNDS

Akihide Kooda, Gifu; Itsuo Nishioka, Fukuoka; Takeshi Nishiyori, Gifu, and Shoji Yahara, Fukuoka, all of Japan, assignors to Kabushiki Kaisha Tsumurajuntendo, Tokyo, Japan

Filed Sep. 22, 1983, Ser. No. 534,702
Claims priority, application Japan, Nov. 24, 1982, 57-204482
Int. Cl.[3] C07C *47/228, 43/168, 39/21*
U.S. Cl. 568—442 11 Claims

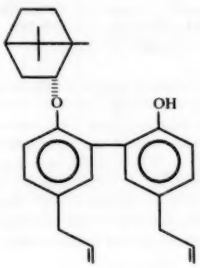
1. An hydroxybiphenyl compound of the formula:



(I)

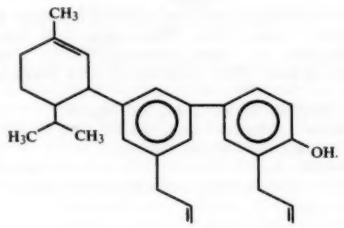
wherein one of R_1 and R_2 is a hydrogen atom and the other is a hydroxyl group and R_3 is a hydroxyl group or a group of the formula —CH=CH—COH.

11. A substantially pure hydroxybiphenyl compound of the formula:



(II)

or of the formula:



(III)

4,537,997

PROCESS FOR TREATING HYDROFORMYLATION CATALYST

Hidetaka Kojima; Takeshi Horikawa, and Masahiro Kagotani, all of Himeji, Japan, assignors to Daicel Chemical Industries, Ltd., Sakai and Kuraray Co., Ltd., Kurashiki, both of, Japan

Filed Dec. 2, 1983, Ser. No. 557,763
Claims priority, application Japan, Dec. 15, 1982, 57-219650
Int. Cl.[3] C07C *45/50*
U.S. Cl. 568—454 8 Claims

1. In a process for producing an aldehyde by hydroformylation of allyl alcohol with carbon monoxide and hydrogen, in the presence of a rhodium-tertiary phosphine complex hy-

droformylation catalyst, which comprises, in a reaction zone, providing a liquid reaction medium which comprises a solution of said catalyst dissolved in an organic solvent, supplying carbon monoxide, hydrogen and allyl alcohol to said liquid reaction medium under conditions that effect hydroformylation of said allyl alcohol to convert same to the aldehyde, then extracting the aldehyde from the liquid reaction medium with water and separately recovering said solution of said catalyst dissolved in said organic solvent wherein the recovered solution of said catalyst is substantially free of said aldehyde, hydrogen and carbon monoxide and contains spent catalyst, the improvement which comprises: placing said recovered solution in a treatment zone separate from said reaction zone and, in said treatment zone, heating said recovered solution at a temperature of from 40° to 100° C., in contact with a gaseous mixture of carbon monoxide and hydrogen mixed at a volume ratio of from 1:99 to 80:20, to restore the activity of said spent catalyst whereby said solution containing the restored catalyst an be recycled to said reaction zone as said liquid reaction medium.

4,537,998

PROCESS FOR THE OXIDATION OF ISOBUTYLENE OXIDE TO METHACROLEIN

Wilfred P. Shum, East Windsor; John F. White, Princeton, both of N.J., and Eva M. Beals, Washington Crossing, Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 257,675, Apr. 27, 1981,. This application Aug. 13, 1984, Ser. No. 639,765

Int. Cl.³ C07C *47/22, 45/32*

U.S. Cl. 568—483 **9 Claims**

1. A method for producing methacrolein comprising: contacting at a temperature between 250° and 350° C. a catalyst comprising a member selected from the group consisting of a heteropolyacid or a salt thereof and an oxide of a metal of Group IV A, V A, VI A, VII A, VIII, or I B of the Periodic Table of Elements, thallium, tin, lead, arsenic, antimony, bismuth, phosphorous, cerium, uranium and thorium with an isobutylene oxide vapor in the presence of oxygen to produce a reaction mixture containing said methacrolein.

4,537,999

PROCESS FOR A PRODUCTION OF DINITROPHENYL ETHERS

Tetsuya Ogawa; Shinichi Saitoh, both of Chibaken; Takeshi Inoi, Kanagawaken; Masaji Kato, Shizuokaken, and Heitaro Obara, Miyagiken, all of Japan, assignors to Chisso Corporation, Osaka and Kaken Pharmaceutical Co., Ltd., Tokyo, both of, Japan

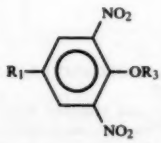
Filed Sep. 21, 1983, Ser. No. 534,145

Claims priority, application Japan, Sep. 30, 1982, 57-172265

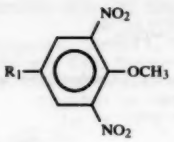
Int. Cl.³ C07C *41/14, 79/35*

U.S. Cl. 568—584 **3 Claims**

1. A process for producing a dinitrophenyl ether of the formula



wherein R_1 represents a member selected from the group consisting of methyl, sec.-butyl, t-butyl and cyclohexyl, and R_3 represents a member selected from the group consisting of ethyl, propyl, isopropyl, sec.-butyl, t-butylcyclohexyl, phenylpropyl, phenyl, 3,5-dichlorophenyl, 2-chloro-4-methyl-phenyl 2-ethoxy-phenyl, and 3,5-dimethyl-4-chloro-phenyl, which process comprises reacting a compound of the formula



wherein R_1 is as defined above, with a compound of the formula

R_3OH

wherein R_3 is as defined above, in the presence of an alkaline compound.

4,538,000

NON-IONIC UNSATURATED CHEMICAL COMPOUNDS

Rodney W. Parr, Doncaster, Australia, assignor to Dulux Australia Ltd., Melbourne, Australia

Filed Nov. 21, 1983, Ser. No. 554,104

Claims priority, application Australia, Dec. 3, 1982, PF7102

Int. Cl.³ C07C *43/15*

U.S. Cl. 568—616 **2 Claims**

1. A non-ionic chemical compound having both hydrophilic and lipophilic components, the hydrophilic component comprising a polyalkylene oxide chain and the lipophilic component comprising at least one ethylenic double bond, characterised in that

(a) the hydrophilic component comprises at least two ethylene oxide units

(b) the lipophilic component has a molecular weight of 1000 maximum and comprises an entity derived from an unsaturated compound selected from the group consisting of pentaerythritol triallyl ether and trimethylolpropane diallyl ether; and

(c) the compound has an HLB value of below 8.

4,538,001

1-ARYLOXY-4-AMINO-2-BUTANOLS

Carl D. Lunsford, and Ying-Ho Chen, both of Richmond, Va., assignors to A. H. Robins Company, Inc., Richmond, Va.

Continuation of Ser. No. 418,940, Sep. 16, 1982, abandoned, which is a division of Ser. No. 813,056, Jul. 5, 1977, Pat. No. 4,379,167, which is a continuation-in-part of Ser. No. 730,498, Oct. 17, 1976, abandoned, which is a continuation of Ser. No. 618,984, Oct. 2, 1975, abandoned, which is a continuation-in-part of Ser. No. 518,122, Oct. 25, 1974, abandoned. This application Sep. 11, 1984, Ser. No. 649,331

Int. Cl.³ C07C *43/225*

U.S. Cl. 568—633 **4 Claims**

1. A 1-aryloxy-4-chloro-2-butanol compound having the formula:

$$ArO—CH_2—CHOH—CH_2—CH_2Cl$$

wherein Ar is 1-naphthyl, 2-naphthyl, indene-4-yl, or indene-5yl.

4,538,002
PROCESS FOR THE PRODUCTION OF HYDROXYANISOLE AND ALKYLATED HYDROXYANISOLES

Howard A. Colvin, Akron; Joel Muse, Jr., Kent, and William S. Hollingshead, Cuyahoga Falls, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 10, 1984, Ser. No. 649,231
Int. Cl.[3] C07C *41/18, 41/16, 37/00, 39/19*
U.S. Cl. 568—650 15 Claims

1. A process for the production of alkylated hydroxyanisoles which consists essentially of:

(A) dehydrogenating para-isopropylphenol in the vapor phase by passing para-isopropylphenol over a catalyst consisting of CuO and Cr_2O_3, the weight ratio of Cr_2O_3 to CuO ranging from 2:1 to 1:1, at a temperature from 350° C. to 650° C. and at an LHSV of from 1.0 to 3.0 to yield para-isopropenylphenol;

(B) reacting para-isopropenylphenol with a methylating agent to yield para-isopropenylanisole;

(C) reacting para-isopropenylnisole with hydrogen peroxide in the presence of a mineral acid and a solvent to yield para- hydroxyanisole;

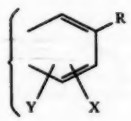
(D) reacting para-hydroxyanisole with an alkylating agent wherein the alkyl radical is from 3 to 6 carbon atoms to yield the alkylated hydroxyanisole.

4,538,003
MONOORGANYLATION OF DIHALOAROMATICS

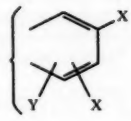
Wilson Tam, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 546,097, Oct. 27, 1983, abandoned. This application Feb. 24, 1984, Ser. No. 583,336
Int. Cl.[3] C07C *41/18, 17/00, 25/02, 25/18*
U.S. Cl. 568—656 50 Claims

1. A method for making compounds of the formula:



comprising reacting a compound of the formula:



with the compound RMX'
wherein:

is an aromatic moiety selected from one of benzene, naphthalene or anthracene;

X is individually Cl or Br, there being no more than one Br atom in the starting compound;

Y is hydrogen, C_1 to C_{20} branched or straight chain alkyl or alkoxy, cycloalkyl, alkaryl, aryl, aralkyl, substituted alkyl, cycloalkyl, alkaryl, aryl, aralkyl, in which the substituents do not react with RMX';

R is C_1 to C_{20} branched or straight chain alkyl containing no tertiary carbon centers, cycloalkyl, alkaryl, aralkyl, or aryl;

M is Mg or Zn; and

X' is Cl, Br, or I;

in the presence of a nickel/bidentate phosphorus catalyst complex or a nickel/tridentate phosphorous catalyst complex; wherein the bidentate phosphorous ligands are selected from the group consisting of:

$(C_6H_5)_2P(CH_2)_aP(C_6H_5)_2$, where a=1, 2, 3 or 4;

$(CH_3)_2P(CH_2)_bP(CH_3)_2$, where b=1, 2, 3 or 4; and

cis-$(C_6H_5)_2PCH=CHP(C_6H_5)_2$;

and the tridentate ligands are selected from the group consisting of:

$[(C_6H_5)_2P]_3$, CH,

$[(C_6H_5)_2PCH_2]_3CCH_3$,

$[(C_2H_5)_2PCH_2]_3CCH_3$,

$[o\text{-}(C_6H)_5PC_6H_4]_2PC_6H_5$,

$[o\text{-}(C_2H_5)_2PC_6H_4]_2PC_6H_5$,

$C_6H_5P[(CH_2)_2P(\text{cyclohexyl})_2]_2$,

$[(C_6H_5)_2P(CH_2)_2]_2PC_6H_5$,

$C_6H_5P[(CH_2)_2P(CH_3)_2]_2$,

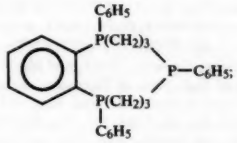
$CH_3P[(CH_2)_2P(CH_3)_2]_2$,

$CH_3P[(CH_2)_2P(C_6H_5)_2]_2$,

$(CH_3)_2P(CH_2)_2P(C_6H_5)(CH_2)_2P(C_6H_5)_2$,

$(CH_3)_3CCH_2P[(CH_2)_2P(CH_3C(CH_3)_3)_2]_2$,

and



with the nickel/bidentate phosphorus catalyst complex, at least one molar equivalent, based on nickel, or triarylphosphine is also present during the reaction.

4,538,004
AROMATIC COUPLING PROCESS

G. Patrick Stahly, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed May 4, 1984, Ser. No. 607,303
Int. Cl.[3] C07C *79/24*
U.S. Cl. 568—707 10 Claims

1. A process which comprises reacting (a) a 2-trifluoromethyl-1-nitrobenzene having a replaceable hydrogen in the 4-position with (b) a phenol having a replaceable hydrogen in the 4-position and selected from the group consisting of phenol and substituted phenols bearing at least one inert ring substituent selected from alkyl, alkoxy, alkenyl, alkynyl, cycloalkyl, aryl, aralkyl, and alkaryl groups in an inert solvent and in the presence of an alkali metal hydride, hydroxide, or alkoxide to form a 4-(3-trifluoromethyl-4-nitrophenyl)phenol.

4,538,005
AROMATIC COUPLING PROCESS

G. Patrick Stahly, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed May 7, 1984, Ser. No. 607,432
Int. Cl.[3] C07C *79/24*
U.S. Cl. 568—707 10 Claims

1. A process which comprises reacting (a) a 3-trifluoromethyl-1-nitrobenzene having a replaceable hydrogen in the 4-position with (b) a phenol having a replaceable hydrogen in the 4-position and selected from the group consisting of phenol and substituted phenols bearing at least one inert ring substituent selected from alkyl, alkoxy, alkenyl, alkynyl, cycloalkyl, aryl, aralkyl, and alkaryl groups in an inert solvent in the

presence of an alkali metal hydride, hydroxide, or alkoxide to form a 4-(2-trifluoromethyl-4-nitrophenyl)phenol.

4,538,006

AROMATIC COUPLING PROCESS

G. Patrick Stahly, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed May 4, 1984, Ser. No. 606,952

Int. Cl.³ C07C *79/24*

U.S. Cl. 568—707 **9 Claims**

1. A process which comprises reacting (a) a 1,3-dinitrobenzene having a replaceable hydrogen in the 4-position with (b) a phenol having a replaceable hydrogen in the 4-position and selected from the group consisting of phenol and substituted phenols bearing at least one inert ring substituent selected from alkyl, alkoxy, alkenyl, alkynyl, cycloalkyl, aryl, aralkyl, and alkaryl groups in an inert solvent and in the presence of an alkali metal hydride, hydroxide, or alkoxide to form a 4-(2,4-dinitrophenyl)phenol.

4,538,007

PROCESS FOR THE SIMULTANEOUS RECOVERY OF 4-HYDROXY-DIPHENYL AND 4,4'-DIHYDROXYDIPHENYL

Eike Gabel, Cologne; Heinz U. Blank, and Horst Behre, both of Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 26, 1984, Ser. No. 573,990

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1983, 3303220

Int. Cl.³ C07C *37/68, 37/84*

U.S. Cl. 568—751 **17 Claims**

1. A process for simultaneously separating 4-hydroxydiphenyl and 4,4'-dihydroxydiphenyl from a mixture containing an alkali metal salt thereof which comprises adjusting the water and alkali metal content of said mixtures such that it contains a stoichiometric excess of 1–15 mols of alkali metal hydroxide per mol of the combined amount of 4-hydroxydiphenyl or 4,4'-dihydroxydiphenyl or the corresponding phenolate thereof and the alkali metal hydroxide is present in an amount of 4–25% by weight based upon the weight of the water, whereby to form a solid phase which contains a predominant amount of said 4-hydroxydiphenyl or the corresponding phenolate and a solution phase which contains a predominant amount of said 4,4'-dihydroxydiphenyl or the corresponding phenolate, separating said solution phase and said solid phase at −28° C. to +40° C. and acidifying at least one of said phases.

4,538,008

PREPARATION OF ORTHO-ALKYLATED PHENOLS

Bruce E. Firth, Arlington Heights, Ill., and Terry J. Rosen, Berkeley, Calif., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 440,676, Nov. 10, 1982, Pat. No. 4,447,652. This application Apr. 20, 1984, Ser. No. 602,302

Int. Cl.³ C07C *37/00, 39/06*

U.S. Cl. 568—783 **15 Claims**

1. A method of rearranging a secondary alkyl or tertiary alkyl phenyl ether to an ortho-alkylphenol, where the alkyl group contains from 3 to about 20 carbon atoms, comprising contacting said ether with alumina, aluminum phosphate, or a silica-modified alumina at a temperature from about 75° C. to about 175° C. and recovering the orthoalkyl phenol.

4,538,009

PREPARATION OF SUBSTITUTED PHENOLS

Norbert Goetz, Limburgerhof; Harald Laas, Maxdorf; Peter Tavs, Limburgerhof; Leopold Hupfer, Friedelsheim, and Karl Baer, Weinheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

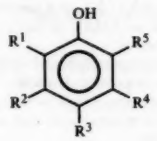
Filed Apr. 12, 1984, Ser. No. 599,574

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1983, 3314372

Int. Cl.³ C07C *37/06*

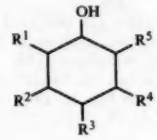
U.S. Cl. 568—799 **14 Claims**

1. An improved process for the preparation of a substituted phenol of the formula I



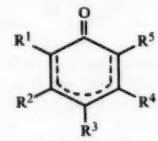
I

where R^1, R^2, R^3, R^4 and R^5 are each independently hydrogen or an aliphatic or aromatic hydrocarbon radical, by dehydrogenating a cyclic alcohol of the formula II



II

or a cyclic ketone of the formula III



III

where one of the broken lines can be an additional C—C bond, in the gas phase at from 150° to 380° C. over a supported noble metal catalyst, wherein the dehydrogenation catalyst used is palladium or platinum on an aluminum spinel carrier which, in addition to aluminum, contains magnesium, zinc, cobalt or nickel.

4,538,010

ALCOHOL RECOVERY PROCESS

William D. Diana, Belle Mead, N.J., assignor to Exxon Research & Engineering Co., Florham, N.J.

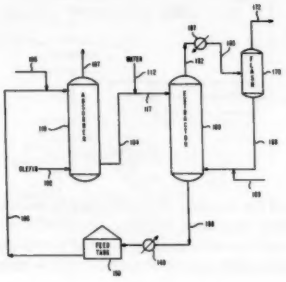
Filed Sep. 17, 1984, Ser. No. 650,874

Int. Cl.³ C07C *29/86, 31/12*

U.S. Cl. 568—918 **30 Claims**

1. An improved process for recovering alcohols from acid-/alcohol feedstreams comprising aqueous strong acid solutions containing said alcohols which comprises (a) contacting said acid/alcohol feedstream in an extraction zone with an effective amount of an extraction solvent selected from the group consisting of alicyclic and acyclic carboxylic acids having from 6 to 20 carbons per molecule and mixtures thereof, for a time and under conditions sufficient to selectively extract said alcohol from said acid/alcohol feedstream and to form a first liquid phase comprising an alcohol-enriched carboxylic acid extract, and a second liquid phase comprising an aqueous strong acid raffinate depleted in alcohol, (b) introducing said alcohol-

enriched carboxylic acid extract into an alcohol vaporization zone and contacting said extract therein with substantially anhydrous stripping vapors, in an amount and under conditions sufficient to form an overhead product comprising at least a



majority of said alcohol passed to said vaporization zone and an alcohol-depleted carboxylic acid extraction solvent liquid, (c) recovering said alcohol vapors from said vaporization zone, and (d) recycling said alcohol-depleted carboxylic acid extraction solvent to said extraction zone.

4,538,011

METHOD FOR THE PREPARATION OF HALOGEN SUBSTITUTED METHANES AND ETHANES

Russell S. Drago, Gainesville, Fla.; James G. Miller, Nyack, N.Y., and Keith D. Weiss, Gainesville, Fla., assignors to University of Florida, Gainesville, Fla.

Filed Apr. 24, 1984, Ser. No. 603,301

Int. Cl.³ C07C *17/00*

U.S. Cl. 570—240 **37 Claims**

1. A method for the preparation of CH_3X or a mixture of CH_3X and $XCH_2\text{-}CH_3$, wherein X is a halogen selected from the group consisting of chlorine, bromine, fluorine and iodine, comprising contacting CO, H_2 and HX at a temperature below 200° C. in the presence of a catalytic amount of a metal carbonyl complex having the formula $M_n(CO)_m$, wherein M is a transition metal, n and m are the same or different and represent integers having a value of at least 1, said complex being capable of oxidatively adding H_2 or HCl and further being in association with (1) at least one Lewis or Brönsted acid capable of coordinating the oxygen atom of said carbonyl moiety and (2) at least one Lewis base other than CO attached to the metal atom of the metal carbonyl complex capable of oxidatively adding hydrogen or HX or a metal carbonyl complex having the formula $Z_y[M_n(CO)_m{}^{y-}]$ wherein M, n and m have the meanings set forth above, y is an integer having a value of at least 1 and Z is a cation or a cationic support ionically bonded to or in association with the transition metal anion.

4,538,012

OLIGOMERIZATION OF LIQUID OLEFIN OVER A NICKEL-CONTAINING SILICACEOUS CRYSTALLINE MOLECULAR SIEVE

Stephen J. Miller, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Feb. 27, 1984, Ser. No. 584,031

The portion of the term of this patent subsequent to Nov. 22, 2000, has been disclaimed.

Int. Cl.³ C07C *2/02*

U.S. Cl. 585—255 **15 Claims**

1. A process for oligomerizing alkenes comprising:

(a) contacting a C_2 to C_{20} olefin or mixture thereof in the liquid phase with a nickel-containing silicaceous crystalline molecular sieve in the hydrogen form selected from the group consisting of silicalite, an organosilicate disclosed in U.S. Pat. No. RE 29,948, and CZM or mixtures thereof, at a temperature from about 45° F. to about 450° F.;

(b) recovering an effluent comprising oligomerized alkene.

4,538,013

PROCESS FOR PRODUCING DIELS-ALDER ADDUCTS WHILE INHIBITING THE FORMATION OF POLYMERIC BY-PRODUCTS

Wilhelm Donike, Marl; Helmut Ulrich, Dorsten; Heinz Thiemer, Marl, and Josefa Pieper, Haltern, all of Fed. Rep. of Germany, assignors to Chemische Werke Huls AG, Marl, Fed. Rep. of Germany

Filed Mar. 2, 1984, Ser. No. 585,471

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1983, 3307486

Int. Cl.³ C07C *3/00*

U.S. Cl. 585—361 **9 Claims**

1. In a process for preparing 5-vinylnorbornene-2 by the Diels-Alder reaction of 1,3-butadiene with cyclopentadiene, dicyclopentadiene or a mixture thereof, at a temperature of 120°–250° C., with exclusion of oxygen, and in the presence of an effective polymerization inhibiting amount of a polymerization inhibitor, and recovering the 5-vinylnorbornene-2 thereby prepared,

the improvement wherein said polymerization inhibitor is nitric oxide (NO), a nitric oxide precursor capable of liberating NO in situ, or a mixture thereof.

4,538,014

CATALYSIS OVER ACTIVATED ZEOLITES

Joseph N. Miale, Lawrenceville, and Clarence D. Chang, Princeton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 552,541, Nov. 16, 1983, Pat. No. 4,500,419, which is a continuation-in-part of Ser. No. 355,413, Mar. 8, 1982, Pat. No. 4,427,787. This application Nov. 5, 1984, Ser. No. 668,353

Int. Cl.³ C07C *1/20*

U.S. Cl. 585—408 **21 Claims**

1. A process for converting a feedstock comprising an alcohol, ether or mixture thereof to conversion products comprising hydrocarbons which comprises contacting said feedstock at conversion conditions with a catalyst composition comprising a supported crystalline zeolite, said zeolite having an initial silica-to-alumina mole ratio greater than about 100, prepared by a method which comprises compositing said crystalline zeolite with alumina, reacting the composite with a dilute aqueous solution of hydrogen fluoride of from about 0.1 to about 5 Normal at a temperature of from about 0° C. to about 30° C. for a time of less than about 60 minutes, drying the hydrogen fluoride reacted composite, treating the dried hydrogen fluoride reacted composite by contact with an ammonium salt solution, by hydrolysis or ammonolysis, and calcining the resulting material at a temperature of from about 200° C. to about 600° C.

4,538,015

CATALYSIS OVER ACTIVATED ZEOLITES

Joseph N. Miale, Lawrenceville, and Clarence D. Chang, Princeton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 552,542, Nov. 16, 1983, Pat. No. 4,500,422, which is a continuation-in-part of Ser. No. 355,415, Mar. 8, 1982, Pat. No. 4,427,788. This application Nov. 5, 1984, Ser. No. 668,356

Int. Cl.³ C07C *1/20*

U.S. Cl. 585—408 **16 Claims**

1. A process for converting a feedstock comprising an alcohol, ether or mixture thereof to conversion products comprising hydrocarbons which comprises contacting said feedstock at conversion conditions with a catalyst comprising a zeolite composition prepared by a method which comprises impreg-

nating a zeolite having an initial silica-to-alumina mole ratio of 70 or more with an ammoniacal aluminum fluoride solution at a temperature of from about 0° C. to about 100° C., said solution comprising from about 0.1 to about 5 weight percent of an aluminum fluoride in solution with at least one member selected from the group consisting of ammonium hydroxide and ammonia, contacting the impregnated zeolite with a warm aqueous 0.1 to 2 Normal solution of an ammonium salt, and calcining the ammonium salt solution contacting material at a temperature of from about 200° C. to about 600° C.

4,538,016

CATALYSIS OVER ACTIVATED ZEOLITES

Joseph N. Miale, Lawrenceville, and Clarence D. Chang, Princeton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 552,543, Nov. 16, 1983, Pat. No. 4,500,420, which is a continuation-in-part of Ser. No. 355,416, Mar. 8, 1982, Pat. No. 4,427,789. This application Nov. 5, 1984, Ser. No. 668,355

Int. Cl.³ C07C *1/20*

U.S. Cl. 585—408 **18 Claims**

1. A process for converting a feedstock comprising an alcohol, ether or mixture thereof to conversion product comprising hydrocarbons which comprises contacting said feedstock at conversion conditions with a catalyst comprising a zeolite composition prepared by a method which comprises the steps of (1) compositing a porous crystalline zeolite having an initial silica-to-alumina mole ratio greater than about 100 with alumina, (2) impregnating the composite under a vacuum with an aqueous solution of an alkali metal fluoride, (3) contacting the impregnated composite with a warm aqueous solution of an ammonium salt, and (4) calcining the ammonium salt solution contacted material at a temperature of from about 200° C. to about 600° C.

4,538,017

CONVERSION OF PARAFFINS TO AROMATICS

James R. Butler, and James M. Watson, both of Big Spring, Tex., assignors to Cosden Technology, Inc., Dallas, Tex.

Filed Aug. 1, 1984, Ser. No. 636,852

Int. Cl.³ C07C *3/20*

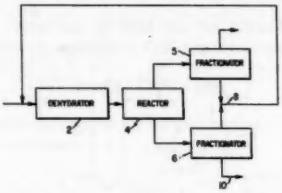
U.S. Cl. 585—415 **21 Claims**

1. In a method of producing aromatic compounds from a paraffin containing feed stock, the combination comprising:

(a) passing said feedstock into a reaction zone into contact with a catalyst system within said reaction zone comprising a discrete physical mixture of a shape-selective crystalline silica polymorph silicalite homologation catalyst and a metal or metal oxide dehydrogenation catalyst,

(b) providing a temperature within said reaction zone sufficient to cause the dehydrogenation of paraffinic hydrocarbons to olefins, the oligomerization of olefinic hydrocarbons to cyclic naphthenes and the aromatization of said naphthenes, and

(c) providing temperature and pressure conditions and relative concentrations of said silicalite catalyst and said dehydrogenation catalyst in said mixture to provide a relationship between the thermodynamic constraint for the dehydrogenation of said paraffinic hydrocarbons and the balancing of the kinetics of said dehydrogenation and oligomerization reactions to limit the olefin concentration within said reaction zone to a value which does not produce substantial coking of said catalyst system.



4,538,018

SURFACE CONDITIONING IN OLEFIN DIMERIZATION REACTORS

Cecil O. Carter, Wann, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 13, 1983, Ser. No. 560,788

Int. Cl.³ C07C *2/24*

U.S. Cl. 585—512 **31 Claims**

1. A method for dimerizing at least one α-olefin in a reactor comprising the steps of:

(a) contacting the surface of said reactor with a homogeneous catalyst selective to dimerization, comprising at least one hydrocarbon-soluble nickel compound as first catalyst component, and at least one organoaluminum compound selected from the group consisting of hydrocarbyl aluminum halides and hydrocarbyl aluminum as second catalyst component, wherein the feed rates of said first and second catalyst components are adjusted so as to give a molar ratio of aluminum in said second catalyst component to nickel in said first catalyst component (Al/Ni mol ratio) being below a first value;

(b) introducing at least one α-olefin having from 2 to 20 carbon atoms into said reactor;

(c) operating said reactor under such conditions as will result in the dimerization of the α-olefin, with the Al/Ni mol ratio of the catalyst being below said first value, for a first period of time ranging from about 0.1 to about 25 hours so as to pre-condition the interior surface of said reactor; and

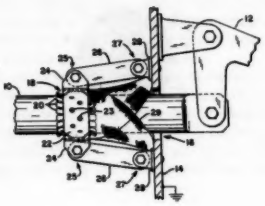
(d) thereafter operating said reactor for a second period of time with the feed rates of said first and second catalyst components adjusted so as to give an Al/Ni mol ratio of the catalyst being at a second value which is higher than said first value.

4,538,019

GROUNDING OF A CONTROL ROD EXTENDING THROUGH AN OPENING IN A STRUCTURE

Frank Bramwell, Hamden, and John DeSouza, Shelton, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 30, 1984, Ser. No. 605,323
Int. Cl.[3] H01R 4/66; H05K 9/00
U.S. Cl. 174—6 6 Claims



1. A structure having an opening therethrough, a control rod extending through said opening and being movable both longitudinally and transversely through the opening, and a grounding device providing an electrical path between said control rod and said structure;

said grounding device including a conductive wiper surrounding and resiliently contacting the control rod while allowing for longitudinal motion of the control rod in the wiper; and

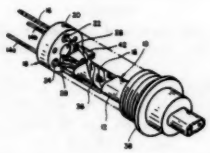
mounting means attaching the wiper to the structure adjacent the opening while allowing for relative transverse motion between the wiper and the structure.

4,538,020

DEVICE TO SEPARATE WIRES TO BE ENCAPSULATED IN A CONNECTOR

Donald Tucker, Mountain View, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Feb. 6, 1984, Ser. No. 577,106
Int. Cl.[3] H02G 3/18
U.S. Cl. 174—65 R 14 Claims



1. A device for maintaining physical separation between electrical conductors of a cable passing through a connector and for facilitating encapsulation of said conductors in a connector body, said device comprising:

(a) an insulating platform having a configuration for engaging a connector body, said platform having

(i) at least one passageway for passage of a conductor;

(ii) at least one aperture through which an encapsulant can be dispensed; and

(iii) at least one opening for allowing air to be voided during an encapsulation process;

said platform, when engaged with a connector body, forming therewith a hollow chamber through which at least one conductor passes and into which encapsulant can be dispensed through said aperture; and

(b) a spline that extends from said platform for locating said device within a connector body; said spline comprising an extended step portion for resting on a cable and for defining a predetermined separation distance between a cable and said platform.

11. Electrical apparatus comprising

(1) a connector comprising

(a) an inlet

(b) an outlet, and

(c) a chamber between the inlet and the outlet;

(2) an electrical cable which enters the connector through said inlet and which at that point comprises

(a) at least two conductors, each of said conductors being surrounded by an insulating primary jacket, and

(b) an outer insulating jacket which surrounds the insulated conductors; a terminal portion of said outer jacket having been removed to form an outer jacket shoulder which lies within the chamber of the connector, and terminal portions of the primary jackets having been removed to form primary jacket shoulders which lie with the chamber of the connector and to expose terminal portions of the conductors which pass through the outlet of the connector;

(3) an encapsulant which substantially fills the chamber and which encapsulates the electrical cable within the chamber; and

(4) a conductor separating member which is composed of an insulating material and which comprises

(a) a platform which engages the outlet of the connector and which comprises

(i), at least two passageways through which pass said exposed terminal portions of the conductors;

(ii) at least one aperture through which said encapsulant has been dispensed into the hollow chamber, and

(iii) at least one opening through which air was voided from the hollow chamber, and

(b) a spline which extends from the platform into the chamber of the connector and which contacts the outer jacket shoulder of the conductor, the spline comprising an extended step portion for resting on the cable and for defining a predetermined separation distance between the cable and the platform.

4,538,021

CABLE CLOSURE HAVING ASYMMETRICAL END PLATE ASSEMBLY

Andrew H. Williamson, Jr., Doraville, Ga., assignor to AT&T Bell Laboratories, Inc., Murray Hill, N.J.

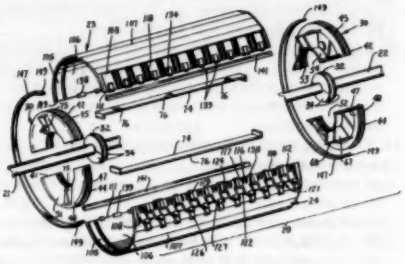
Filed Apr. 6, 1984, Ser. No. 597,688
Int. Cl.[3] H02G 5/113, 5/013
U.S. Cl. 174—92 18 Claims

1. A closure adapted to have at least one cable extend thereinto, said closure comprising:

first and second end plate assemblies being spaced apart and each comprising portions assembled together to form a flanged peripheral portion connected to a wall which converges inwardly toward the interior of said closure and which terminates adjacent to a hub which is offset from the flanged peripheral portion along a longitudinal axis of said closure, each said hub being disposed with said closure and having an opening which is adjacent to have a cable extend therethrough;

first and second covers which are assembled together to engage the flanged portion of each of said end plate assemblies and form a cylindrical housing; and

means disposed within said housing and aligned with each said hub in a plane normal to the longitudinal axis for applying balanced forces to each said end plate assembly



to secure together said portions thereof and to maintain each said hub having a cable extending therethrough in compliant engagement with a sealing material which is disposed about the cable within the hub opening.

4,538,022

FLEXIBLE ELECTRIC CABLE

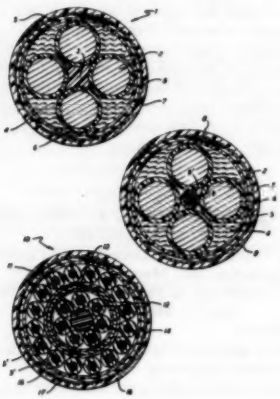
Max Barnicol-Öttler; Martin Loczenski, both of Neustadt; Norbert Mieschke, Coburg; Gerhard Ott; Gerhard Przybylski, both of Neustadt, and Dietmar Weber, Coburg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 21, 1982, Ser. No. 451,737

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1981, 3151235

Int. Cl.³ H01B *7/04*

U.S. Cl. 174—113 R **8 Claims**



1. In a flexible electric multiconductor cable, comprising a core; insulated conductors twisted about the core in one or more layers; and a plastic or rubber jacket surrounding the insulated conductors, the improvement comprising: a structural element which extends over the entire length of the cable and consists, at least in a region adjacent to the outer surface of the insulated conductors, of a rubber-elastic material with a Shore-A hardness of at most 75; and each insulated conductor having the outer surface of its insulation joined in a material-bonded manner to said structure.

4,538,023

AUDIO SIGNAL CABLE

Bruce A. Brisson, 1081 Kachina Ct., Fremont, Calif. 94539

Continuation-in-part of Ser. No. 372,550, Apr. 28, 1982,. This application Dec. 30, 1983, Ser. No. 567,080

Int. Cl.³ H01B *11/12*

U.S. Cl. 174—115 **14 Claims**

1. A cable for transmitting signals which have relatively high and relatively low frequency components over substantially the entire audio frequency range comprising at least one inner conductor for principally transmitting the low frequency components of said signal, a plurality of outer conductors surrounding said inner conductor for principally transmitting the relatively high frequency components of said signal, the lengths of the outer conductors being sufficiently greater than the length of the inner conductor to insure substantially equal speeds of transmitting for said low frequency components and said high frequency components along said cable, and an outer layer of insulating material surrounding said outer conductors.

4,538,024

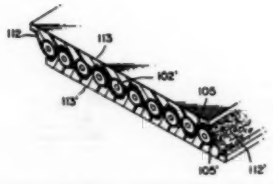
FLAT MULTICONDUCTOR CABLE EXTRUDED ON A WHEEL

Joseph A. Wise, Hershey, and Michael P. Green, Mechanicsburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 510,475, Jul. 1, 1983, , which is a continuation-in-part of Ser. No. 437,999, Nov. 1, 1982, abandoned. This application Apr. 9, 1984, Ser. No. 598,142

Int. Cl.³ H01B *7/08*

U.S. Cl. 174—117 F **1 Claim**



1. A substantially endless flat multiconductor cable of the type comprising a plurality of conductors in side-by-side parallel relationship and a ribbon of insulating material in which the conductors are encased, the ribbon of insulating material having oppositely facing first and second major surfaces and side edges, the cable being characterized in that:

the cable is a composite cable comprising first and second cable parts which are substantially identical, the first major surface being on the first cable part and the second major surface being on the second cable part, the first and second cable parts having opposed interface surfaces which are against each other,

every other conductor in the cable being embedded in the interface surface of the first cable part, the remaining conductors being embedded in the interface of the second cable part, the first and second cable parts being offset from each other laterally of the cable axis so that every other conductor is between an adjacent pair of the remaining conductors, the cable parts being laminated together at their interface surfaces,

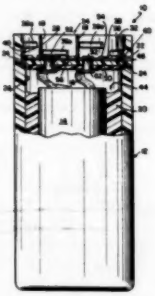
each of the cable parts having been manufactured by continuously passing wires partially around the circumference of a molding wheel, extruding thermoplastic material onto the surface of the molding wheel, chilling the extruded thermoplastic while the wires are on the wheel, and continuously removing the cable parts from the wheel.

4,538,025

ANCHORING APPARATUS FOR A CAPACITOR

Jerry R. Coe; Godfrey R. Pearce, and Francis R. See, all of Glasgow, Ky., assignors to Emhart Industries, Inc., Indianapolis, Ind.

Filed Jan. 16, 1984, Ser. No. 570,883
Int. Cl.³ H01G *9/06*
U.S. Cl. 174—52 S **8 Claims**



1. An electrical device comprising an electrical component, a housing having an open end for receiving the electrical component, a closure member for sealing the open end of the housing, the housing including an inner wall and a shoulder on the inner wall providing an axially outwardly facing seat for the closure member, retaining means for retaining the closure member in sealing engagement with the seat, the retaining means including a plurality of radially outwardly extending ears for gripping the inner wall of the housing, and a plurality of radially inwardly projecting lugs on the inner wall of the housing, each lug having an axially inwardly facing surface for engaging the ears to maintain the closure member in sealing engagement with the seat.

4,538,026

LOOP BACK SYSTEM FOR LOOP TRANSMISSION LINE

Kazuo Yasue, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

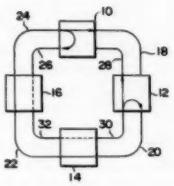
Filed Feb. 28, 1984, Ser. No. 583,538
Claims priority, application Japan, Feb. 28, 1983, 58-32291
Int. Cl.³ H04L *11/16*
U.S. Cl. 178—2 R **4 Claims**

1. A loop back system for a loop transmission line, comprising: an active loop and a backup loop which are paired for transmitting data;

a plurality of transmission devices each being connected to said active loop and said backup loop for generating a loop-back command;

first loop-back command transmission means for causing first one of the transmission devices to transmit a first loop-back command to second one of the transmission devices which is connected to the active loop and to be looped back, said second transmission device being located in the active loop, to which data is to be transmitted, downstream of and adjacent to said first transmission device;

first loop-back means for looping back the second transmission device such that the second transmission device received the first loop-back command is turned back from



the active loop to the backup loop while being kept in connection with the active loop;

second loop-back command transmission means for causing the first transmission device to transmit a second loop-back command to third one of the transmission devices after the second transmission device is looped back by the first loop-back means, said third transmission device being located in the active loop downstream of and adjacent to the second transmission device; and

second loop-back means for looping back said third transmission device such that the third transmission device received the second loop-back command is turned back from the backup loop to the active loop.

4,538,027

SYSTEM FOR INPUTTING A SECURITY CODE TO A COMPUTER

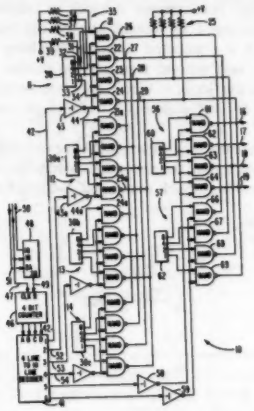
Craig E. Deyer, Akron, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Jul. 28, 1982, Ser. No. 402,426
Int. Cl.³ H04K *1/00*
U.S. Cl. 178—22.01 **9 Claims**

1. A system for inputting a multi-bit security code to a computer comprising:

a plurality of security bit input means for individually providing the bits of said security code, each of said security bit input means having a plurality of common output lines, said security bit input means also including output line

selection means for selecting the output lines upon which said security bits are provided; and



means for sequentially actuating said security bit input means whereby said security bits are sequentially provided to said computer.

4,538,028

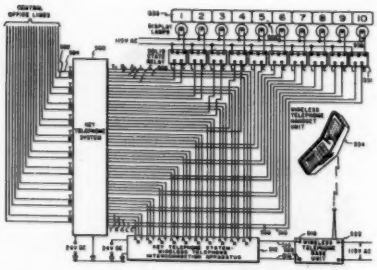
APPARATUS FOR USE WITH KEY TELEPHONE SYSTEM WITH WIRELESS TELEPHONE DEVICE

Italo Gazzoli, Clearwater, and Frank Keller, Tampa, both of Fla., assignors to General Telephone of Florida, Tampa, Fla.

Filed Sep. 30, 1983, Ser. No. 538,073

Int. Cl.[3] H04Q *7/04;* H04M *1/72*

U.S. Cl. 179—2 EA **10 Claims**



1. In combination with a key telephone system having output circuits connectable to a plurality of outside lines which are connected to a central exchange, said output circuits including lamp controlling circuits adapted for connection to a like plurality of signal lamps, each lamp being associated with a corresponding outside line whereby when said output circuits are connected to said outside lines and said lamp controlling circuits are connected to said lamps, each lamp is lit when its corresponding outside line is busy and is dark when its corresponding outside line is free:

a wireless telephone device having a base unit with first and second output terminals and a separable cooperating handset unit having a manually operable number entry device, said units having cooperating transmitters and receivers which permit wireless communication links to be established between said units;

said plurality of signal lamps being connected to said lamp controlling circuits, said lamps being visually accessible in the vicinity of said cordless telephone; and

cordless telephone - key telephone interconnection means having first and second input terminals respectively connected to the first and second output terminals of the base unit and having output terminals connected to the output circuits of the key system, said means establishing a plurality of calling numbers for said outside lines to be used by a user of the handset unit, there being a different number associated with each different outside line whereby when said system output circuits are connected to said exchange and said wireless links are established between said units, said user, after observing the lamps to identify these outside lines which are free, can enter any number corresponding to any one of the free outside lines into the device in the handset unit in order to establish a communication channel between the outside line corresponding to the number entered and said handset unit.

4,538,029

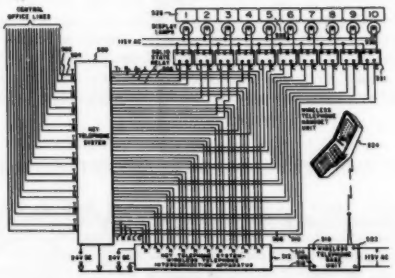
APPARATUS FOR USE WITH KEY TELEPHONE SYSTEM WITH WIRELESS TELEPHONE DEVICE

Italo Gazzoli, Clearwater, and Frank Keller, Tampa, both of Fla., assignors to General Telephone of Florida, Tampa, Fla.

Filed Sep. 30, 1983, Ser. No. 538,074

Int. Cl.[3] H04Q *7/04;* H04M *1/72*

U.S. Cl. 179—2 EA **10 Claims**



1. Wireless telephone - key telephone interconnection apparatus adapted for connection between a wireless telephone having a base unit with tip and ring output terminals and a separable cooperating handset unit having a manually operable number entry device, and a key telephone system having a plurality of output circuits connectable to a like plurality of outside lines which are connected to a central exchange, each line having a ring conductor and a tip conductor, each output circuit including the same ring and tip conductors as the corresponding line, said apparatus comprising:

an input circuit adapted for connection to said tip and ring output terminals of the telephone;

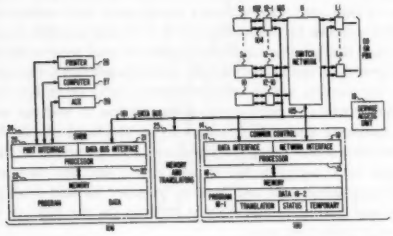
an output network adapted for connection to all of the output circuits of said system;

tone generating means rendered responsive when the apparatus is connected to the telephone and the system and the handset unit is off hook to generate a distinctive dial tone different from central office dial tone and to feed said distinctive tone to said tip and ring terminals whereby the distinctive tone can be reproduced in the handset unit.

4,538,030
METHOD AND APPARATUS FOR ESTABLISHING TELEPHONE CALLING COSTS

Lawrence D. Fossett, Morganville, and Steven C. Michael, Freehold, both of N.J., assignors to AT&T Information Systems Inc., Holmdel, N.J.

Filed Dec. 8, 1983, Ser. No. 559,295
Int. Cl.[3] H04M *15/06, 15/34*
U.S. Cl. 179—7.1 TP 13 Claims



1. A method of establishing the cost of a telephone call made from a first telephone located in a first area code to a second telephone located in one of a number of second area codes the method comprising the steps of:

providing a pair of coordinates based on the geographical location of said first telephone,

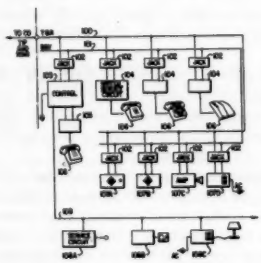
supplying a unique pair of geographical coordinates for each of said number of second area codes, and

determining said telephone cost using the provided coordinates for said first telephone and the supplied coordinates for said one of said number of second area codes within which said second telephone is located.

4,538,031
HOME COMMUNICATIONS AND CONTROL SYSTEM

Gordon D. Benning, Ottawa; Brian J. Pascas; Robert K. Blackhall, both of Kanata; Paul S. Wilker, Ottawa, and Graham A. Neathway, Almonte, all of Canada, assignors to Trillium Telephone Systems Inc., Canada

Filed Sep. 10, 1982, Ser. No. 416,612
Claims priority, application Canada, Sep. 11, 1981, 385716
The portion of the term of this patent subsequent to Jul. 10, 2001, has been disclaimed.
Int. Cl.[3] H04M *1/60, 1/72, 3/42, 11/00*
U.S. Cl. 179—81 B 22 Claims



17. A service circuit for a local telephone line in a building wired with quad telephone conductors, including a tip and ring pair continuous with a subscriber's line connected to a remote switching machine, and a local service lead pair, comprising:

(a) a first special service circuit connected to the quad telephone conductors to which one or more local telephones are connected, for providing a signal path between said tip and ring pair and said local service lead pair,

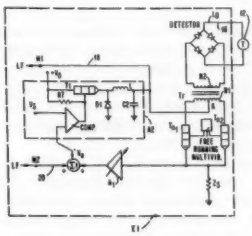
(b) means including a loudspeaker connected to the first special service circuit, for reproducing a message spoken into a microphone of one of said local telephones and carried by said signal path, and

(c) control means connected to the quad telephone conductors for enabling the means including the loudspeaker upon said one of the local telephones going off hook.

4,538,032
INTERFACE CIRCUIT WITH IMPEDANCE ADAPTATION MEANS

Daniel Ballatore, Bar-sur-Loup; Yves A. Bonnet, Saint Laurent due Var; Michel F. Ferry, Vallauris, and Christian A. Jacquart, Gattieres, all of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 8, 1982, Ser. No. 433,346
Claims priority, application European Pat. Off., Oct. 28, 1981, 81430035.6
Int. Cl.[3] H04B *3/03;* H04M *1/76, 19/00*
U.S. Cl. 179—170 D 7 Claims



1. An interface circuit between a bidirectional telephone line carrying in particular low frequency voice signals, and a telephone switching network connected to said interface circuit via a first and a second unidirectional lines, said interface circuit including means for adjusting the impedance (Z_T) seen by said telephone line and including:

a high frequency transformer including a primary with two end terminals and a center tap K, and a secondary;

means for connecting said secondary to said bidirectional line through a rectifier circuit;

switching means for respectively connecting the end terminals of said primary to first and second switches which alternately open and close at a predetermined frequency;

a load of impedance Z_s connecting said switches to ground;

first amplification means whose predetermined gain $A1(\omega)$ is a function of frequency and which is connected to said load;

addition means connected to said first amplification means and to said first unidirectional line;

second amplification means whose predetermined gain $A2(\omega)$ is a function of frequency and which has an input from said addition means and an output to said center tap; and

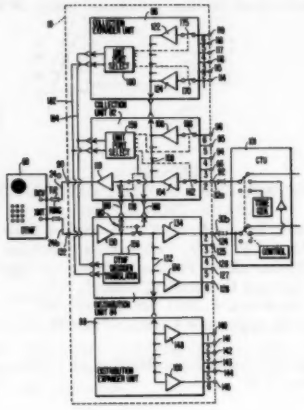
means for connecting said center tap to said second unidirectional line wherein said gains $A1(\omega)$ and $A2(\omega)$ are made adjustable so that the product $A1(\omega).A2(\omega)$ will be substantially proportional to Z_T in a predetermined frequency range.

4,538,033

DATA BRIDGE WITH GATING AND/OR TESTING

Duncan Bruce, Staatsburg, and Charles E. Conklin, Pleasant Valley, both of N.Y., assignors to Conklin Instrument Corporation, Pleasant Valley, N.Y.

Filed Dec. 29, 1983, Ser. No. 566,705
Int. Cl.³ H04M *1/24*
U.S. Cl. 179—175 **20 Claims**



1. A communication bridge responsive to a series of control signals containing a bridge address code and a port address code, the bridge comprising:

a primary port,

a plurality of secondary ports,

branching means for coupling the primary port to the plurality of secondary ports,

a plurality of electrically operated switch means connected in series with the respective secondary ports,

bridge switch enablement means connected to the primary port and responsive to the bridge address code corresponding to a predetermined bridge address for enabling a bridge switching function, and

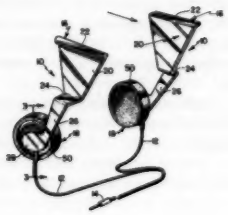
port address means enabled by the bridge switch enablement means and being responsive to the port address code for selectively operating one of the plurality of electrically operated switch means.

4,538,034

EARPHONE ASSEMBLY

Alan French, 27 Druid Rd., Warwick, R.I. 02888

Filed Mar. 18, 1983, Ser. No. 476,761
Int. Cl.³ H04M *1/05*
U.S. Cl. 179—182 R **5 Claims**



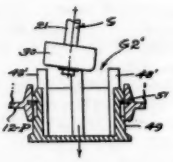
1. An earphone assembly for use in combination with a relatively narrow flexible head gear for retaining an earphone unit adjacent an ear on the head of a user comprising a bracket member and an earphone unit mounted on said bracket member, said bracket member comprising a main body portion, an upper flange which extends outwardly from said main body portion, and an intermediate portion which extends outwardly from said main body portion in downwardly spaced relation to said flange when said earphone assembly is received on the head of said user, said flange, said body portion and said intermediate portion cooperating to define a channel which is dimensioned to receive said head gear in engagement therein for retaining said bracket member between the head gear and the head of said user, said channel being open and substantially unobstructed to facilitate the removal of said bracket member from and the installation thereof on said head gear while said head gear is on the head of a user, said bracket further comprising a leg portion which extends downwardly from said intermediate portion in outwardly offset relation to said ear when said earphone assembly is mounted on the head of said user, said earphone unit being mounted on said leg portion so that it is urged into engagement with said ear of said user as a result of the engagement of said bracket member by said head gear when said earphone assembly is secured on the head of said user with said head gear.

4,538,035

JOYSTICK OCCLUSION GATE CONTROL FOR VIDEO GAMES

Danny J. Pool, 2942 Indian Creek, Bishop, Calif. 93541

Continuation-in-part of Ser. No. 446,508, Feb. 11, 1983, Pat. No. 4,479,083. This application Oct. 13, 1983, Ser. No. 541,687
Int. Cl.³ H01H *25/04*
U.S. Cl. 200—6 A **34 Claims**



1. A joystick control for the selective actuation of at least two contact members along right angularly related X and Y axes intersecting a centered axis of a gimbaled joystick, and including;

a mounting fixedly carrying said at least two contact members disposed about said X and Y axes in right angular relation to each other forming an opening configuration for simultaneous actuation of said at least two right angularly related contact members,

the joystick being gimbaled on the mounting and extending therefrom to be tilted laterally from the centered axis and having a cam portion simultaneously engageable with said at least two right angularly related contact members,

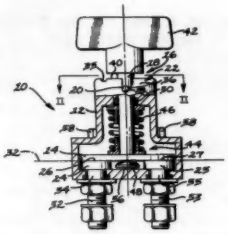
means yieldingly urging the joystick into alignment with the centered axis,

and a selectively positionable gate carried by the mounting concentric with the centered axis and having an obstruction engageable with the joystick and restricting movement of the cam portion thereof into a corner area of the opening configuration between said angularly related contact members for individual actuation of each of said contact members.

4,538,036
ELECTRICAL SWITCHING APPARATUS

Andrew L. Heinrich, Peoria, and Richard L. Oljace, Washington, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed May 18, 1982, Ser. No. 648,232
Int. Cl.³ H01H *19/54*
U.S. Cl. 200—11 EA **9 Claims**



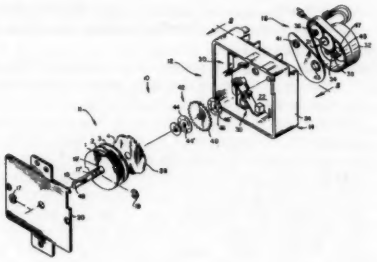
1. An electrical switching apparatus (10) comprising:
a housing (12) having a cam (22);
a contact (14) movable between first and second positions within said housing (12);
a shaft (18) having a shaft end (56) and a cam follower (20), said shaft (18) extending through said housing (12) and said movable contact (14) and being slidably and rotatably movable relative to said movable contact (14);
multiple spaced apart stationary contacts (24,25) each having a contact surface (26,27), said stationary contacts (24,25) being positioned within said housing (12), and said contact surfaces (26,27) defining a plane (32);
means (16) for moving said movable contact (14) from said first position to said second position at a first rate and for moving said movable contact (14) from said second position to said first position at a second rate, said rates differing substantially one from the other and being controlled by said cam (22) and follower (20); and
wherein said cam (12) includes first and second detents (28,30) disposed substantially radially opposite one another about said shaft (18) along a second plate parallel to and at a first elevational distance from said contact surface defining plane (32);
a third detent (34) annularly positioned between said first and second detents (28,30) and located along a third plane parallel to and at a second elevational distance from said contact surface defining plane (32), said third detent (34) being spaced relatively annularly near one of said first and second detents (28,30), and spaced relatively annularly distant from the other of said first and second detents (28,30); and
a first annular cam portion (36) having a predetermined slope and being positioned between said first and third detents (28,34), and a second annular cam portion (38) having a first segment substantially parallel to said contact surface defining plane (32) and a second segment substantially perpendicular to said contact surface defining plane (32), said second cam portion (38) being positioned between said second and third detents (30,34).

4,538,037
CLUTCH FOR A TIMING MECHANISM

Daniel K. Amonett, Indianapolis, Ind., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Filed May 31, 1984, Ser. No. 615,776
Int. Cl.³ H01H *43/10*
U.S. Cl. 200—38 R **4 Claims**

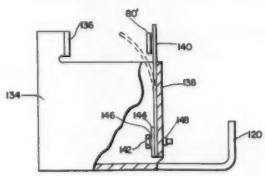
1. A timing mechanism comprising:
(a) a shaft rotatably journalled between end plates,
(b) a first drive gear fixedly carried by said shaft,
(c) first cam means fixedly carried by said shaft,
(d) a one piece integrally constructed second cam means and a second drive gear carried by said shaft and independently rotatable thereof,
(e) motor drive means and a gear train connected thereto, said gear train including at least two output pinions providing two rotational outputs at different speeds, one of said two output pinions connected to said first drive gear, the other output pinion of said two output pinions connected to said second drive gear through a lost motion connection, and
(f) electrical switch means opening and closing in response to the rotation of said first and second cam means.

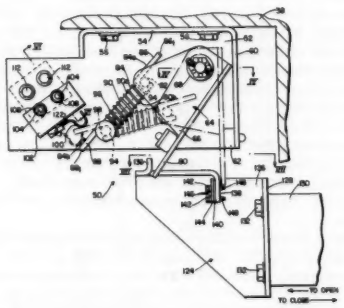


4,538,038
DOOR PANEL POSITION SENSOR ASSEMBLY

Benjamin B. James, Birchrunville, and Edward Peel, Havertown, both of Pa., assignors to Westcode, Inc., Frazer, Pa.

Filed Nov. 9, 1983, Ser. No. 550,084
Int. Cl.³ H01H *3/16*
U.S. Cl. 200—61.71 **18 Claims**





12. A door position sensor assembly for sensing the position of the door of a transit vehicle and for indicating whether the door is in the open or closed position thereof, said door being

movable along a predetermined path between the open and closed positions thereof and said door position sensor comprising:

a mounting bracket mounted on the trailing edge of the door and comprising first and second, longitudinally spaced actuator members spaced apart along said predetermined path, said second actuator member being located closest to the trailing edge of the door and comprising a directional flexible actuator which is rigid for one direction of travel of the and is flexible for the other direction of travel of the door; and

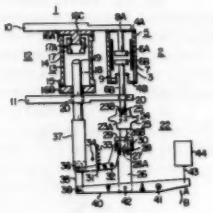
a second mounting bracket mounted on the vehicle adjacent to the path of travel of the door, actuator means mounted on said second mounting bracket and including a single actuator arm pivotable between a first position in which the actuator is engageable by both of said actuator members and a second position in which the actuator is engageable by only said first actuator, said single actuator arm normally being in the second position thereof when the door is open and being pivoted to the first position thereof by said first actuator arm during the movement of the door to the closed position and being pivoted from the first position thereof to the second position thereof during movement of the door to the open position, and switch means, mounted on said second mounting bracket and actuated responsive to pivoting of said single actuator arm to the first position thereof, for signalling that the door is closed.

4,538,039

COMPOSITE CIRCUIT BREAKER

Yoshitomo Gotoh, Hitachi, and Kiyofumi Iwamoto, Ibaraki, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 14, 1983, Ser. No. 484,894
Claims priority, application Japan, Apr. 19, 1982, 57-63895
Int. Cl.³ H01N *33/66, 33/16*
U.S. Cl. 200—144 B **17 Claims**



1. A composite circuit breaker comprising:

a vacuum circuit-breaking part including a vacuum envelope, at least one pair of contacts disposed within said vacuum envelope, and rods respectively extending to an exterior of said vacuum envelope from said contacts;

a closing switching part disposed in parallel with said vacuum circuit-breaking part and including a closed housing having disposed therein at least one pair of contact members, a dimension of a stroke of engagement between said contact members is larger than that between said contacts, and contact rods extending to the exterior of said closed housing from said contact members, respectively;

conductors respectively connecting said rods to said contact rods;

operating means including operating rods respectively operatively connected with one of said rods and one of said contact rods associated with one of said conductors, said operating rods moving one of said contacts and one of said contact members so that said contacts and said contact members are respectively connected and disconnected; and

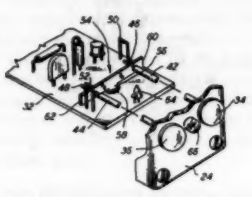
delaying means including a delaying lever associated with said operating means, said delaying means delaying a connecting and disconnecting operation of said contacts latter than that of said contact members.

4,538,040

ELECTRICAL SWITCH MEANS PARTICULARLY ADAPTED TO GFCI TEST AND RESET SWITCHES

DeHertburn N. Ronemus, North Syracuse, and Victor M. Tice, Manlius, both of N.Y., assignors to Pass & Seymour, Inc., Solvay, N.Y.

Filed Oct. 5, 1983, Ser. No. 539,155
Int. Cl.³ H01H *1/26*
U.S. Cl. 200—159 A **3 Claims**



1. A ground fault circuit interrupter module having switch means for selectively testing and resetting a circuit-interrupting means, said module comprising:

a. a housing including a rigid, substantially planar cover member;

b. first and second, manually movable actuating members having portions mounted in spaced relation upon said cover member;

c. a generally planar printed circuit board mounted within said housing and having a portion in proximity to said cover member, said board carrying at least a portion of said circuit-interrupting means, and including said switch means;

d. first and second electrical contact pins fixedly attached to and extending outwardly in the same direction from said board at spaced positions along a line substantially parallel to the plane of said cover member;

e. first and second discrete terminals on said board to which said first and second pins are respectively physically and electrically connected;

f. an elongated strip of electrically conducting, springy metal having a central portion essentially midway between opposite, first and second end portions;

g. a third discrete terminal on said board located between said first and second terminals;

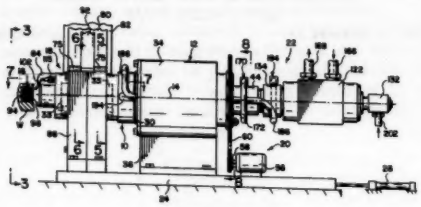
h. a solder connection physically and electrically connecting said central portion of said strip to said third terminal, said solder connection providing the sole means of physical support of said strip, said first and second end portions extending to positions in proximity to said first and second pins, respectively, for movement into and out of contact therewith by flexing said strip about said central portion; and

i. portions on each of said first and second actuating members positioned to contact said first and second end portions, respectively, to move the latter into and out of contact with said first and second contact pins in response to manual movement of said actuating members, said first, second and third terminals being so arranged in said circuit-interrupting module that movement of said first end portion operates a first switch means to create a simulated ground fault to actuate said circuit-interrupting means, and movement of said second end portion operates second switch means to electrically restore said circuit-interrupting means to its operative, non-actuated condition, said third terminal being common to the circuits of both said first and second switch means.

4,538,041
ROTATING INDUCTION HEATING APPARATUS

Roger R. Budzinski, Seven Hills, Ohio, assignor to Park-Ohio Industries, Inc., Shaker Heights, Ohio

Filed Aug. 24, 1983, Ser. No. 525,996
Int. Cl.³ H05B 6/14
U.S. Cl. 219—10.75 26 Claims

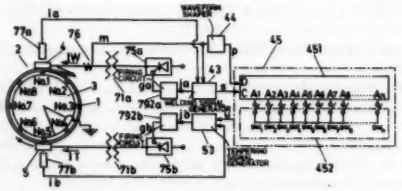


1. Apparatus for inductively heating a non-rotating workpiece having an axis and a surface concentric therewith, comprising spindle means of insulating material having an axis and axially opposite ends, axially reciprocable slide means, means including said slide means supporting said spindle means for rotation about said axis, inductor means supported on one of said ends of said spindle means for rotation therewith, means providing a primary winding spaced radially outwardly of and extending about said spindle means and having ends connectable across a source of alternating current, means including said slide means supporting said primary winding in axially fixed and concentric relationship with said spindle means, plate means extending about said spindle means between said opposite ends thereof and providing a secondary winding concentric with said spindle axis and supported on said spindle means for rotation therewith, said plate means having circumferentially opposite ends, said inductor means having opposite ends each electrically connected to a different one of said opposite ends of said plate means, means for rotating said spindle means during energization of said primary winding, and means to reciprocate said slide means to selectively bring said inductor means and workpiece surface into magnetically coupled relationship, whereby said workpiece is inductively heated in response to rotation of said spindle means and energization of said primary winding.

4,538,042
METHOD AND APPARATUS FOR FORMING REINFORCING CAGE FOR PRESTRESSED CONCRETE PILE

Masaho Tanaka, Yokohama; Tomio Shishido, Ibaragi; Tetsukazu Fukuhara, Hiratsuka; Yugo Yao, Hiratsuka; Kunihilo Kobayashi, Hiratsuka, and Yoshio Inoue, Chigasaki, all of Japan, assignors to Neturen Co., Ltd., Tokyo; Asahi Kasei Kogyo Kabushiki Kaisha, Osaka and Asahi Kasei Kogyo Kabushiki Hiraoka & Co., Tokyo, all of, Japan

Filed May 25, 1982, Ser. No. 381,761
Int. Cl.³ B23K 11/32
U.S. Cl. 219—58 5 Claims

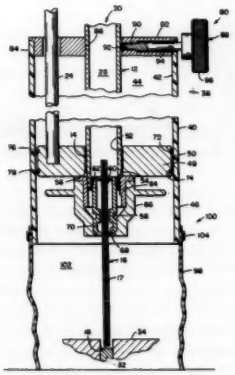


3. In a method of forming a reinforcing cage for prestressed concrete pile including the steps of providing a welding and a tempering rotary electrode which rotate simultaneously in the same direction around the periphery of a cylindrical stationary electrode with a given spacing therebetween, disposing a set of main members in the form of a plurality of steel bars which are to be ultimately used in the prestressed concrete pile so as to be spaced apart circumferentially and slidable axially in parallel relationship with the axis of the stationary electrode, winding an auxiliary member in a helical configuration around the set of main members, causing the welding electrode to urge a crossing of the main member and auxiliary member toward the stationary electrode while simultaneously passing a welding current between the welding and the stationary electrode for a given cycle through the crossing to thereby weld both members together, and causing the tempering electrode to urge the welded crossing toward the stationary electrode while simultaneously passing a tempering current between the tempering electrode and the stationary electrode through the crossing to thereby temper the weld, the welding current and the tempering current being repeatedly passed across the welding and the tempering electrode and the stationary electrode to weld and temper successive crossings to thereby form a reinforcing cage; the improvement comprising the steps of, when the welding electrode reaches a crossing to be welded, generating an energization indication timing signal, which initiates an energization cycle for passing the welding current for the given cycle through the crossing, simultaneously with an energization confirmation time interval signal of less duration in time than the energization cycle for the welding operation, detecting the presence of the welding current, and interrupting the energization cycle for welding and the flow of welding current if insufficient welding current is detected when the energization confirmation time interval is over so that the crossing remains unwelded, and thereafter in response to said interuption, preventing the tempering current from being applied to such unwelded crossing.

4,538,043
WATER SHIELD FOR A METAL DISINTEGRATOR DEVICE

Rayburn G. Alexander, 569 Hawthorne Ave., San Bruno, Calif. 94066

Filed May 23, 1983, Ser. No. 496,887
Int. Cl.³ B23P 1/08
U.S. Cl. 219—69 V 10 Claims



1. A water shield (38) for use with a metal disintegrator (10), having a longitudinally extending quill (12) having one end (14) adapted to hold a longitudinally extending electrode (16), said electrode (16) having a discharge end (18) spaced from said quill (12), vibrating means (20) for longitudinally vibrating

said electrode (16), and fluid delivery means (30) for delivering a stream of pressurized liquid coolant generally parallel to said electrode (16) and against a broken piece of metal (32) embedded in a metallic member (34), comprising:

a rigid tubular member (40) having an inner wall (42) defining an interior tubular cavity (44) positionable in surrounding relation about least said one end (14) of said quill (12) and having a first end portion (46) positionable generally adjacent said electrode (16), said tubular member (40) including a second end portion (84);

a piston (48) having an outer periphery (50) in tight-fitting sliding relation with said inner wall portion (42) and being generally sealingly attached to said quill (12) adjacent said one end (14) thereof; and

positioning means (80) for selectively longitudinally positioning said tubular member (40) in releasably fixed relation relative to said electrode (16), said positioning means (80) including a cover (82) generally covering said second end portion (84) of said tubular member (40), said cover (82) including a longitudinal opening (86) in which said quill (12) is slidably positionable, and fastening means (88) for selectively fastening said quill (12) in fixed relation to said cover (82).

4,538,044

APPARATUS FOR ASSEMBLING MOTORCAR BODY

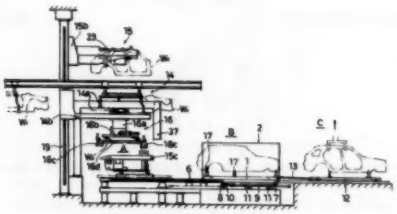
Satoshi Kadowaki, and Yuzi Ikeda, both of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 22, 1983, Ser. No. 564,618

Claims priority, application Japan, Dec. 22, 1982, 57-223859; Dec. 22, 1982, 57-223860; Dec. 25, 1982, 57-226539

Int. Cl.³ B23K *37/04, 9/12*

U.S. Cl. 219—80 **7 Claims**



1. An apparatus for assembling a motorcar body including a set carrier able to reciprocate between a setting station and a welding station in front thereof, the welding station having on both sides thereof welding jig means for connecting by welding side panels to a floor panel and a roof panel, characterized in that the set carrier is provided with floor panel holding members for positioning and supporting the floor panel, side panel holding members for pressing the side panels against and fixing the side panels to the floor panel with the roof panel solely being held between receiving upper edges of the side panel thereby forming a predetermined car body frame work, so that the side panels, the roof panel and the floor panel can be conveyed from the setting station to the welding station as said predetermined car body framework set on the set carrier, and the car body framework may be transferred as it is to the welding jig means at the welding station.

4,538,045

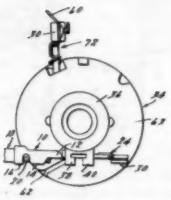
ELECTRIC WIRING TERMINAL AND METHOD OF MAKING SAME

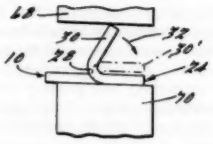
Michael Slavin, Troy, and Ellsworth S. Miller, Mt. Clemens, both of Mich., assignors to Lectron Products, Inc., Rochester, Mich.

Division of Ser. No. 375,764, May 6, 1982, abandoned. This application Jul. 25, 1984, Ser. No. 634,358

Int. Cl.³ B23K *11/16*

U.S. Cl. 219—91.21 **5 Claims**





1. A method of connecting wire coated with a resin-type high temperature insulation to an electrical terminal of metallic material having a connector portion and a relatively large flag portion connected thereto by an essentially narrow neck portion and disposed in acute angular relation with respect to said connector portion, said method comprising the steps of

wrapping said wire around said neck portion with a portion of said wire extending from said neck portion and between said connector portion of said terminal and said flag portion, then

electrically contacting a pair of spaced electrodes with said connector portion of said terminal and said flag portion and passing current therebetween so that resistance to passage of said current by said neck portion heats said neck portion and said wire wrapped therearound sufficiently to explode said insulation from said wire whereby establishing a good electrical connection between said wire and said terminal at said neck portion, and

simultaneously moving at least one of said electrodes toward the other to bend said neck portion and to press said flag portion against said connector portion of said terminal to clamp the extending portion of said wire therebetween.

4,538,046

PRECISE POSITIONING FOR A WELDING ELECTRODE WHICH FOLLOWS A THREE DIMENSIONAL WELD PATH

Gasparas Kazlauskas, 10219 Briarwood Dr., Los Angeles, Calif. 90024

Continuation-in-part of Ser. No. 207,128, Nov. 17, 1980, abandoned. This application Apr. 22, 1982, Ser. No. 370,687

Int. Cl.³ B23K *9/12*

U.S. Cl. 219—125.1 **4 Claims**

1. A welding apparatus for producing a weld along a weld path within a workpiece, said apparatus comprising:

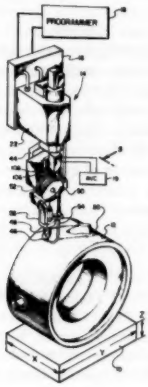
a welding electrode mounted on a welding electrode bracket;

means for producing relative movement between said weld-

ing electrode and said workpiece, said relative movement comprising a plurality of separate axes forming an x-axis and a y-axis and a z-axis, said axes being perpendicular to each other, said z-axis being in a direction toward and away from said workpiece;

a filler wire assembly fixed relative to said welding electrode, said filler wire assembly having an outer free end located directly adjacent to said welding electrode;

a housing, said welding electrode bracket being rotatably mounted upon said housing about a first axis, said welding electrode being located on said first axis, the rotation of said welding electrode bracket being controlled by a predetermined program, said welding electrode bracket to



rotate to continuously maintain said outer free end of said filler wire assembly at a precise position relative to said welding electrode, with said precise position being just forward of said welding electrode as such moves along said weld path, said first axis coinciding with said z-axis; and

said welding electrode being movable along a lineal path relative to said welding electrode bracket, said lineal path coinciding with said z-axis, said movement along said lineal path being controlled by a control means, said control means maintaining the arc voltage constant by physically controlling the spacing of said welding electrode from said workpiece.

4,538,047

METHOD OF CONTROLLING ROBOTIC AUTOMATIC WELDING APPARATUS

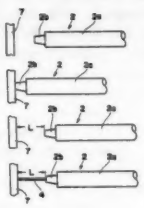
Teruo Nakano, Toyonaka; Hideji Ohtani, Kobe; Kunio Miyawaki, Ashiya, and Shigeo Mogi, Takatsuki, all of Japan, assignors to Hitachi Zosen Corporation, Japan

Filed Nov. 18, 1983, Ser. No. 555,364

Int. Cl.³ B23K *9/10*

U.S. Cl. 219—125.1 **9 Claims**

1. A method of controlling an automatic welding apparatus comprising a welding torch for welding the work to be welded, a robot for movably supporting the welding torch, a feeder for supplying a core wire to the welding torch, and a control device for controlling supply of power to the welding torch, movement of the robot and operation of the core wire feeder, charaterized in that the method comprises the steps of causing the robot to move first until the forward end of the welding torch comes into contact with the work with the forward end of the core wire drawn completely into the torch, subsequently causing the robot to move so that the forward end of the welding torch is brought away from the work by a predetermined amount, and thereafter causing the core wire feeder to inch the core wire until the forward end of the core



wire is projected from the welding torch into contact with the work.

4,538,048

WELDING METHOD AND EQUIPMENT THEREFOR

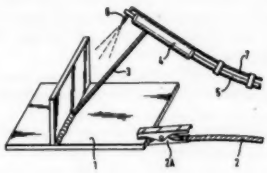
Björn Heed, Utlandagatan 19, 412 61 Götenborg, Sweden

Filed Sep. 10, 1982, Ser. No. 416,548

Claims priority, application Sweden, Sep. 15, 1981, 8105476; Jun. 29, 1982, 8203992

Int. Cl.³ B23K *9/32*

U.S. Cl. 219—137 R **20 Claims**



1. Welding means, comprising: a grounded electrode for connection to a workpiece to be welded, a source of electrical energy, a welding electrode connected to said source of electrical energy for welding said workpiece at a point, at least one further electrode, means for supporting said further electrode adjacent said point of welding at said workpiece, and a current source for generating high voltage direct current, said current source having a first terminal connected to said further electrode, and a second terminal for connection to said workpiece, whereby upon a high-voltage discharge from said further electrode smoke particles formed at the point of welding will be electrically charged and deposited at least on one of said grounded electrode and workpiece.

20. A method of electrical welding a workpiece comprising the steps of:

grounding an electrode to a workpiece to be welded;

connecting a welding electrode to a source of electrical energy;

welding said workpiece at a point with an arc formed by said welding electrode;

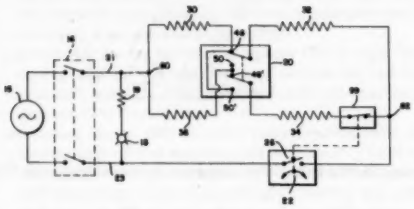
the improvement comprising the steps of providing a high voltage electrode in the welding area;

and establishing a high voltage electrical discharge from said high voltage electrode to the workpiece in the welding area during welding for minimizing particle emission.

4,538,049
TOASTER OVEN

William D. Ryckman, Jr., Orange, Conn., assignor to Black & Decker, Inc., Newark, Del.

Filed Apr. 3, 1984, Ser. No. 596,382
Int. Cl.[3] H05B 1/02; F24C 7/10
U.S. Cl. 219—386 7 Claims



1. An electric toaster oven, comprising:

a chamber adapted to hold at least one item of food in a predetermined position during the application of heat thereto;

an upper heat source including a plurality of upper heating elements positioned in said chamber to heat said food item from above, the electrical resistance of each of said upper heating elements being substantially equal to each other;

a lower heat source including a plurality of lower heating elements positioned in said chamber to heat said food items from below, the electrical resistance of each of said upper heating elements being substantially equal to each other;

circuit energizing means; and switch means for selectively connecting

said circuit energizing means to said heating elements to selectively establish a plurality of circuits, the electrical resistance of said upper heating elements being different from the electrical resistance of said lower heating elements so that

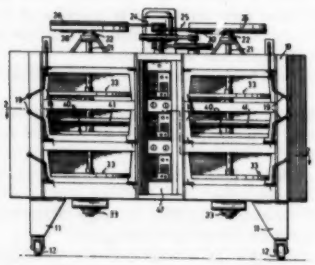
each of said circuits selectively establish different heating ratios with respect to the heat applied to said food items by said upper and lower heat sources,

the rated power output of said upper and lower heat sources being approximately 900 and 600 watts respectively for one heating ratio and approximately 580 and 860 watts respectively for another heating ratio.

4,538,050
BAKER'S OVEN

Paul E. Willett, Clontarf, Australia, assignor to Baker Perkins Exports Pty. Ltd., Springvale, Australia

Filed Oct. 25, 1983, Ser. No. 545,232
Claims priority, application Australia, Oct. 26, 1982, PF6504; Sep. 21, 1983, PG1510
Int. Cl.[3] F27B 9/16; A21B 1/22; F27D 11/00
U.S. Cl. 219—388 5 Claims

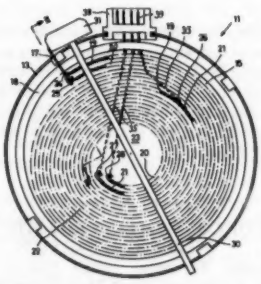


1. A baker's oven comprising a casing, two adjacent series of oven compartments within and insulated from the casing, the compartments of each series being substantially cylindrical, arranged coaxially one above another, and separated by horizontal heat insulating decks, a loading passage leading into each one of the oven compartments through a front opening of the casing, electric heating elements in each of the oven compartments and including top elements mounted under the heat insulating deck forming the compartment top and bottom elements mounted on the heat insulating deck forming the compartment bottom, a drive shaft passing axially through each series of oven compartments, drive means for simultaneously driving the two drive shafts, a rotary support for products to be baked within each oven compartment and being mounted on the drive shaft passing through the compartment, at lest one of the oven compartments containing a second rotary support mounted on the drive shaft passing through the compartment, the two rotary supports being spaced one above another, intermediate thermostatically controlled electric heating elements mounted within said compartment below an upper one and above a lower one of the two rotary supports, said drive means including a drive wheel rotatably mounted on each of the drive shafts, a motor on the casing, a drive from the motor to both of the drive wheels, and rotation transfer means for transferring rotation of each drive wheel to its drive shaft, such means being yieldable to resistance so that each drive shaft may be restrained from rotating without interrupting the drive from the motor to the drive wheels.

4,538,051
HEATING ELEMENT FOR HEATING BOILING PLATES, HOTPLATES AND THE LIKE

Felix Schreder; Leonhard Dörner, both of Oberderdingen, and Eugen Wilde, Knittlingen, all of Fed. Rep. of Germany, assignors to E.G.O. Elektro-Gerate Blanc U. Fischer, Fed. Rep. of Germany

Filed Apr. 19, 1984, Ser. No. 602,122
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1983, 3315438
Int. Cl.[3] H05B 3/68
U.S. Cl. 219—466 11 Claims



1. A heating element for heating an electrical hot plate, comprising:

a support of electrically-insulating material;

a plurality of electrical heating conductors carried by said support and defining a heating area;

a plurality of connection lines for connecting the heating conductors to a source of electrical energy;

a switching means adapted to switch connections to said heating conductors and said source, the switching means being operable to make individual, parallel and series connections of said heating conductors to said source, to energize the hot plate in a plurality of power stages;

a first of said heating conductors being arranged in a first spiral path having a plurality of windings, said first heating conductor extending from an outer end at an outer limit of said heating area to an inner end at a central zone

of said heating area and connected at both said ends to at least one of said connection lines; and,

a second and a third of said heating conductors being serially arranged one after the other in a second spiral path interposed between adjacent windings of said first heating conductor, an outer end of said second heating conductor and an inner end of said third heating conductor being arranged at the outer limit and at the central area, respectively, and being there connected to said connection lines, and, the inner end of the second heating conductor and the outer end of the third heating conductor being connected together and to one of said connecting lines, at a connection point situated in the heating area remote from the central zone.

4,538,052

FIXING ROLLER FOR A COPYING MACHINE

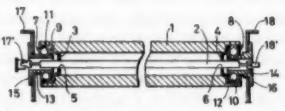
Tetsu Asanuma, Saitama, and Satoru Inagaki, Kanagawa, both of Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jul. 30, 1982, Ser. No. 403,389

Claims priority, application Japan, Jul. 31, 1981, 56-120187

Int. Cl.³ H05B *3/02*; B21B *27/06*

U.S. Cl. 219—469 **4 Claims**



1. A fixing roller for a copying machine comprising a frame means, a heat conductive cylinder, a heater disposed within said cylinder, support means for holding said heater, and bearing means secured to said frame means for rotatably supporting said cylinder on said frame means, said bearing means being comprised of two bearings each having an outer race made of heat resistant resin fitted into opposite end portions of said cylinder under pressure, respectively.

4,538,053

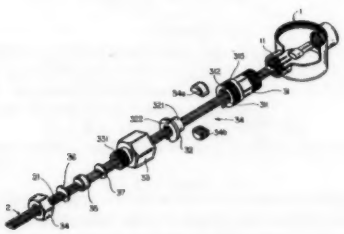
TERMINATION APPARATUS FOR HEATERS IN HAZARDOUS ENVIRONMENTS

Danny G. Morrow, La Honda, and Thomas Y. Oiwa, San Mateo, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Jan. 11, 1983, Ser. No. 457,295

Int. Cl.³ H05B *3/08*

U.S. Cl. 219—541 **8 Claims**



1. Termination apparatus for terminating an elongate electrical heater having an outer metal sheath, the apparatus comprising

(1) a junction box having an entry port through which an elongate heater having a metal outer sheath can be passed for termination within the junction box;

(2) a connection member which is secured to the entry port and which comprises

(a) a first compression member which surrounds a heater passing through the entry port,

(b) a second compression member which surrounds a heater passing through the entry port, the first and second compression members defining between them a chamber having walls spaced apart from a heater passing through the compression members and the entry port,

(c) compression means for drawing the first and second compression members towards each other, without rotating the members relative to each other, along the axis of a heater passing through them, thus reducing the size of the chamber defined by the first and second compression members, and

(d) a grommet which is adapted to be placed within the chamber defined by the first and second compression members, which is composed of lead and is split axially into at least two parts, which has a passageway therethrough conforming generally to the shape of a heater to be passed through the passageway, and which can be deformed into close conformity with a heater passing through the passageway by drawing the first and second compression members towards each other,

the grommet having frusto-conical end sections and the compression members having complementary inverse frusto-conical heating surfaces which bear upon said frusto-conical end sections.

4,538,054

ELECTRIC HEATING FABRIC

André B. de la Bretonière, Beethovenlaan 29, Doorwerth, Netherlands

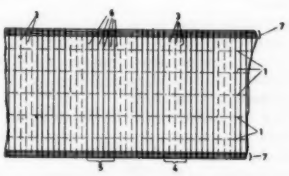
Continuation of Ser. No. 252,735, Apr. 10, 1981, abandoned, which is a continuation of Ser. No. 21,130, Mar. 16, 1979, abandoned, which is a continuation-in-part of Ser. No. 743,750, Nov. 22, 1976, abandoned, which is a continuation-in-part of Ser. No. 523,731, Nov. 14, 1974, abandoned. This application Dec. 27, 1983, Ser. No. 564,780

Claims priority, application Netherlands, Nov. 14, 1973, 7315574

The portion of the term of this patent subsequent to Mar. 23, 1993, has been disclaimed.

Int. Cl.³ H05B *3/34*

U.S. Cl. 219—545 **6 Claims**



1. An electrical heating fabric comprising warp strands and weft strands, two opposed selvedges being formed by interweaving said warp and weft strands, electrically conductive lead wires being provided as a warp in each of said selvedges, warp threads of electrically insulating material being disposed between said selvedges, the weft strands comprising separate spaced groups of thin threads of electrically insulating material and separate spaced groups of thin wires of electrically conductive material, respectively, said groups of weft threads and said groups of weft wires being arranged in alternating parallel first and second groups, each of which first groups contains a plurality of thin parallel threads of electrically insulating material extending directly between the selvedges, each of which second groups contains a plurality of discrete thin wire strands of electrically conductive material extending in straight paral-

lel lines directly between the selvedges, one of the ends of each individual one of the weft wire strands of each of the groups of electrically conductive material being in electrical contact with the lead wires of one of the selvedges and in electrical contact with the lead wires of the other of said selvedges, whereby, for a fabric of predetermined dimensions, various amounts of heat capacity may be provided by electrically disconnecting individual conductive weft strands from the lead wires in the selvedges.

4,538,055

SLIDE RULE

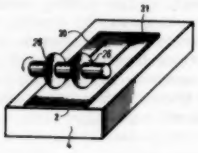
Harald Riehle, Anna-Schieber-Weg 13, D-7300 Esslingen, Fed. Rep. of Germany

Continuation of Ser. No. 447,723, Dec. 7, 1982, abandoned. This application Dec. 7, 1984, Ser. No. 678,390

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1981, 3148355

Int. Cl.³ G06G *1/02*

U.S. Cl. 235—70 R **8 Claims**



1. A slide-rule comprising an upper cover plate, a lower cover plate a pair of spaced apart guide strips and a plastic slide plate situated between the upper and lower cover plates and the guide strips such that the slide plate and the guide strips define parallel slots of a predetermined width, said plastic slide plate having parallel flat surfaces and said upper cover plate and said lower cover plate having at least one flat surface which engages a respective one of the parallel flat surfaces of said slide plate, said slide-rule being made by the process comprising the steps of:

forming spaced parallel slots of substantially equal length in the plastic slide plate by a milling or sawing blade, such that the side surfaces of each slot are perpendicular to the parallel flat surfaces of the slide plate and the width of each slot is equal to the width of the milling or sawing blade;

attaching the upper cover plate and the lower cover plate to a respective one of the parallel flat surfaces of the slide plate at those portions of said parallel flat surfaces situated between the spaced parallel slots and the respective edge of the slide plate; and

cutting the assembly of the upper cover plate, the lower cover plate and the slide plate adjacent both edges perpendicular to the spaced parallel slots forming thereby the guide strips for the slide plate, such that the portion of the slide plate between said slots is slideable relative to the upper cover plate, the lower cover plate and the guide strip's.

4,538,056

CARD READER FOR TIME AND ATTENDANCE

Jorge A. Young, and Bhupendra J. Khandwala, both of Claremont, Calif., assignors to Figgie International, Inc., Richmond, Va.

Continuation of Ser. No. 412,302, Aug. 27, 1982, abandoned. This application Feb. 6, 1985, Ser. No. 698,742

Int. Cl.³ G06C *15/10*

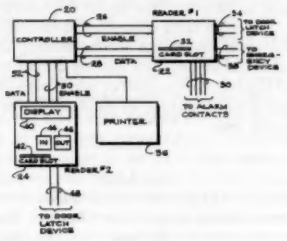
U.S. Cl. 235—377 **20 Claims**

1. A card reader for use in a security system having a central controller and a plurality of said card readers, which controller keeps the time of day, and wherein the central controller and each card reader are electrically connected so as to each define an electrical communication system, each said card reader comprising:

means for reading data stored permanently on a card;

means for determining the time of day;

storage means for said data in said card reader and said time of day;



operative means in said reader for authorizing or refusing authorization independent of the central controller, based upon the data on said card and for causing said data read from said card and said time of day to be stored in said storage means at a first time; and

means for sending said data read from said card and said stored time of day data from said storage means to said central controller at a second time controlled by said electrical communication system.

4,538,057

CASH ACCOUNTING SYSTEM

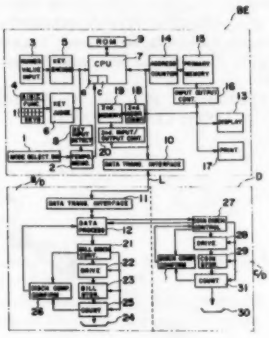
Kenji Iwagami, Sakai, and Hachizou Yamamoto, Kyoto, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 16, 1983, Ser. No. 505,366

Claims priority, application Japan, Jun. 18, 1982, 57-105982

Int. Cl.³ G06F *15/30*

U.S. Cl. 235—379 **2 Claims**



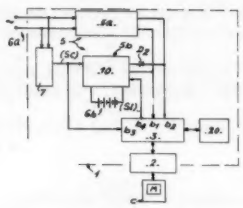
1. A cash accounting system which comprises a cash register (BE) for registering various money transaction information, and a cash dispenser (D) for paying out money in the form of bills and/or coins corresponding to sum of money to be paid out resulting from various transaction registration, said cash register (BE) being electrically coupled to said cash dispenser (D), the improvement comprising means for judging whether or not the cash dispenser (D) corresponds to paying-out of specific money, based on length of data fed from said cash dispenser (D) to said cash register (BE).

4,538,058

POWER SUPPLY SYSTEM OF A DEVICE DESIGNED TO COOPERATE WITH A REMOVABLE ELECTRONIC MEDIUM SUCH AS A CARD AND DEVICE EQUIPPED WITH SUCH A SYSTEM

Michel Ugon, Maurepas, and Serge Fouchard, Plaisir, both of France, assignors to Cii Honeywell Bull (Societe Anonyme), Paris, France

Filed Apr. 20, 1983, Ser. No. 486,670
Claims priority, application France, May 5, 1982, 82 07773
Int. Cl.[3] G06K 5/00
U.S. Cl. 235—380 12 Claims



1. A transaction terminal adapted to cooperate with a portable electronic medium such as a credit card or the like having a non-volatile memory and a first processing circuit, said terminal comprising a second processing circuit for processing data recorded in the memory of the card, the first and second processing circuits being adapted to transfer data therebetween to permit transactions between the terminal and the card; a main supply circuit connected to a main power source for generating a first voltage and for supplying the first voltage to the processors of the terminal and the card; first means for compensating for failure of the main power source, especially during said transfer of data, said first means comprising a backup power supply circuit adapted to be connected to an auxiliary power source for generating a second voltage corresponding to the first voltage; a detector circuit for monitoring the main power source and for generating a control signal upon failure of the main power source during a transaction; second means responsive to the control signal for automatically connecting the auxiliary power source to the backup power supply circuit and for causing the backup power supply circuit to apply the second voltage to the card; and a timing circuit responsive to the control signal for controlling the second means so as to maintain said second voltage applied to the card for a predetermined period of time after said failure sufficient to enable a transaction in progress to be completed and for thereafter disabling the backup power supply circuit and disconnecting the backup power supply circuit from the auxiliary power source.

4,538,059

IDENTIFICATION CARD WITH CONCEALED CODING AND A SIMPLE READER MODULE TO DECODE IT

Peter E. Rudland, Broadstone, England, assignor to ITR International Time-Limited, Swindon, England

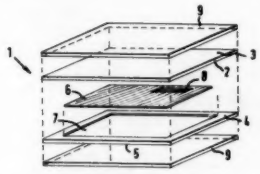
Filed Sep. 13, 1982, Ser. No. 417,624
Claims priority, application United Kingdom, Sep. 16, 1981, 8127962
Int. Cl.[3] G06K 7/10
U.S. Cl. 235—468 16 Claims

1. The combination of an identification card and reading apparatus for said card, said combination comprising:

(a) a card provided with a concealed code which, while being invisible to the naked eye when viewed in visible light, is readable in transmission using infra-red radiation, said code being characterized by successive digits represented by transparent windows alternating with regions opaque to infra-red radiation, the said windows and opaque regions being arranged along a line parallel to one edge of the card and each window representing a binary digit of the code with one binary digit being represented by wide rectangular windows while the other binary digit is represented by significantly narrower windows;

(b) an optoelectric reader consisting of a single source of infra-red radiation and a single infra-red detector arranged to either side of a card slot to enable the coded card to be read on passage along the slot; and

(c) an electronic system responsive to a signal from said



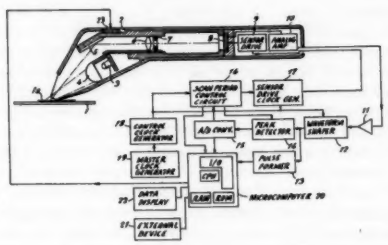
reader and having a first threshold detector arranged to produce a clock signal each time that the reader detects a window in the card and a second threshold detector arranged to produce a second signal to represent a binary one when a second threshold level of output from the electronic reader is passed, the absence of said second signal when a clock signal is detected indicating the presence of a binary ZERO whereby said code windows are self-clocking and the code can be scanned independently of the rate at which said card is moved along the slot.

4,538,060

OPTICAL READING APPARATUS HAVING A READING SENSOR OF ELECTRONIC SCANNING TYPE

Toshiyasu Sakai; Masahiro Hara, both of Kariya, and Nobuyuki Teraura, Tokai, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed May 31, 1983, Ser. No. 499,406
Claims priority, application Japan, May 31, 1982, 57-93375
Int. Cl.[3] G06K 7/10
U.S. Cl. 235—472 14 Claims



1. An optical reading apparatus for converting optically readable information into an electrical signal by means of a reading sensor of electronic scanning type, comprising:

first means for detecting the intensity of light incident on an information label on which said optically readable information is provided; and

second means responsive to said first means for controlling the scanning period of said reading sensor.

4,538,061

RAILWAY WORK MACHINE

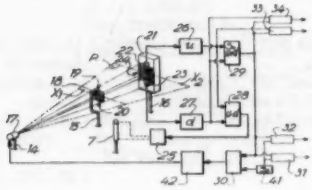
André Jaquet, Crissier, Switzerland, assignor to SIG Societe Industrielle Suisse, Neuhausen-Chutes du Rhin, Switzerland

Continuation of Ser. No. 340,971, Jan. 20, 1982,. This application May 23, 1984, Ser. No. 613,747

Claims priority, application Canada, Sep. 25, 1981, 6191/81

Int. Cl.[3] G01J *1/20*

U.S. Cl. 250—201 2 Claims



1. A railway work machine comprising railway track displacement tool for correcting levelling and/or alignment defects of the railway track, at least one regulating member for adjusting the displacements of at least one of said tools, and a detection device for the detection of said defects, said detection device being connected to and controlling said regulating member and comprising, in combination, at least one series of three feelers arranged one behind the other at three spaced points of a line of rails of said railway track and to which there are connected, respectively in order, a point-source of light-rays emitter, a screen which masks off a part of said rays and has at least two parallel delimiting edges spaced apart from each other in the direction of the defect to be corrected, a receiver having at least one group of two photosensitive cell means for emitting electrical signals proportional to their irradiated surfaces and to the intensity of their irradiation, said two cell means having identical dimensions and electrical characteristics and being spaced apart from each other and aligned in a direction perpendicular to said two delimiting edges of the screen, whereby the two projected images of said two delimiting edges of the screen fall each in the middle of one of said two cell means when the axis of symmetry of the two delimitting edges is located in a reference plane defined by said point-source of light-rays and the axis of symmetry of said two cell means, and the difference of the irradiated surfaces of said cell means is proportional to the amplitude of the detected defects, a processing circuit for the signals emitted by said two cell means comprising a first totalizer which delivers a control signal proportional to the difference between the values represented by said signals, which signal is used as a control signal for said regulating member, a second totalizer which delivers a signal proportional to the sum of the values represented by said signals, and a pilot circuit for said emitter comprising a comparator having a first input connected to said second totalizer and a second input connected to a generator of a reference signal representative of an instruction irradiation intensity and the output of which is connected to a feed regulator for said point-source of light-rays of the emitter, whereby the sum of the irradiated surfaces of said two cell means is a constant equal to the surface of one of them and therefore the signal delivered by the second totalizer is only representative of the intesity of irradiation of said two cell means and this intensity is maintained as a constant equal to the instruction intensity, while the value of the control signal is exclusively proportional to the difference of the irradiated surfaces of said two cell means and therefore said value of the control signal may also be used as in indication of the actual amplitude of the detected defects.

4,538,062

FOCUSING DETECTING DEVICE WITH COAXIAL SOURCE AND DETECTOR

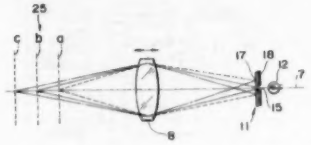
Yoshio Shishido, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 16, 1982, Ser. No. 442,087

Claims priority, application Japan, Nov. 10, 1981, 56-186530; Nov. 19, 1981, 56-185980; Nov. 20, 1981, 56-186531; Jan. 14, 1982, 57-4117; Jan. 20, 1982, 57-13774

Int. Cl.[3] G01J *1/20*

U.S. Cl. 250—201 31 Claims



1. A focusing detecting device comprising

an optical system defining an optical axis between an image forming surface and an object to be photographed;

a light projecting means having a small aperture for projecting a light therethrough and along said optical axis onto the object to be photographed; and

a light receiving means having a small aperture for receiving light reflected from the object along said axis and a photoelectric converting surface adjacent said aperture with at least one of said aperture and said surface being in a position optically conjugate with the image forming surface said surface being disposed to emit a signal in response to the reflected light being received thereon whereby a focused state is detected with the reflected light being received within said aperture of said light receiving means.

4,538,063

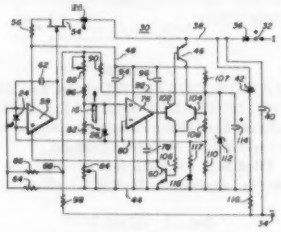
PHOTO TRANSDUCER CIRCUIT FOR SETTING MINIMUM AND MAXIMUM CURRENT FLOW BETWEEN POWER TERMINALS

Bulent Bulat, Derby, Conn., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jan. 5, 1983, Ser. No. 455,679

Int. Cl.[3] G05F *1/56;* H01J *40/14*

U.S. Cl. 250—214 R 10 Claims



1. A photo transistor circuit, comprising:

first and second power terminals for supplying power to said transducer circuit,

a photo emitter for producing light,

a first photo receiver positioned to receive light from said photo emitter,

means responsive to said first photo receiver for regulating the amplitude of light produced by said photo emitter,

a second photo receiver positioned to receive a variable amount of the light from said photo emitter,

means responsive to said second photo receiver for controlling the amplitude of current flow between said first and second power terminals wherein said current flow comprises the output signal of said photo transducer circuit, and

means connected to said means responsive to said second photo receiver for setting a minimum amplitude and a maximum amplitude for said current flow between said power terminals.

4,538,064

DEVICE FOR THE MONITORING OF ICE FORMATION

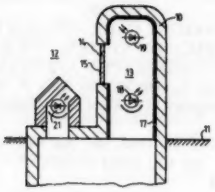
Paul Kovacs, Am Brunnenbächli 2, CH-8125 Zollikerberg, Switzerland

Filed Nov. 12, 1982, Ser. No. 441,167

Claims priority, application Switzerland, Nov. 13, 1981, 7310/81

Int. Cl.³ G01N *21/17*; G01W *1/00*; G08B *21/00*

U.S. Cl. 250—231 R **8 Claims**



1. A device for monitoring the formation of ice, comprising:

a first radiation source for continuously emitting radiation;

a second radiation source for intermittently emitting radiation;

light-sensitive means disposed so as to receive said radiation from said first and second radiation sources and capable of producing an electrical output signal in response to said radiation from either radiation source;

a transparent element disposed between one of said radiation sources and said light-sensitive means, the transparency of said transparent element being changeable depending upon whether said transparent element is clean or is contaminated with a deposit of foreign material; and

circuitry means responsive to said output signal of said light-sensitive means, said circuitry means providing at least one output for indicating the presence of ice on said transparent element, wherein said output signal of said light-sensitive means varies as a function of said changes in transparency of said transparent element and may be substantially continuous or substantially intermittent depending on the transparency of the transparent element.

4,538,065

STROBOSCOPIC SCANNING ELECTRON MICROSCOPE

Motosuke Miyoshi, Fujisawa, and Tetsuya Sano, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 28, 1983, Ser. No. 470,632

Claims priority, application Japan, Mar. 1, 1982, 57-30593; Jun. 25, 1982, 57-109525

Int. Cl.³ G01N *23/00*

U.S. Cl. 250—310 **6 Claims**

1. A stroboscopic scanning electron microscope which comprises:

a scanning electron microscope having a beam pulse generator for emitting a pulsed electron beam onto an object to be measured;

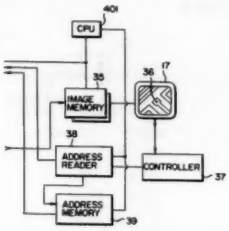
test signal supplying means for supplying a test signal to the object;

beam pulse generating means for controlling said beam pulse generator in response to a synchronizing signal from said test signal supplying means;

scanning controlling means for controlling scanning by the electron beam from said beam pulse generator;

detecting means for detecting the number of secondary electrons generated from the object upon focusing of the electron beam thereon;

memory means for storing data of the number of secondary electrons detected by said detecting means for use in developing potential contrast images;



displaying means for displaying said potential contrast images from said data stored in said memory means;

display controlling means for controlling said display means; and

address generating means for reading a desired address of said memory means which is accessed by said displaying means and for generating an address signal to said memory means.

4,538,066

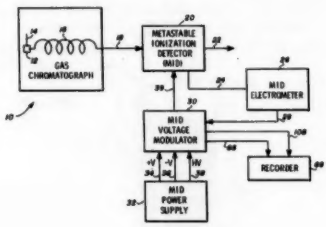
MODULATED VOLTAGE METASTABLE IONIZATION DETECTOR

Glenn C. Carle, Sunnyvale; Daniel R. Kojiro, San Jose, and Donald E. Humphry, Cupertino, all of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 22, 1984, Ser. No. 582,643

Int. Cl.³ H01J *47/02*

U.S. Cl. 250—374 **13 Claims**



1. In a gas chromatographic system which employs a carrier gas, and a metastable ionization detector which provides an output signal representative of the concentration of constituents of a substance passing through said system, apparatus for increasing the operating range of said system, which comprises:

power supply means for providing a high voltage ionization potential to said metastable ionization detector; and

modulation means responsive to said output signal to maintain the high voltage ionization potential at a maximum amplitude for constituent concentrations below a predetermined threshold level, and to cause the ionization po-

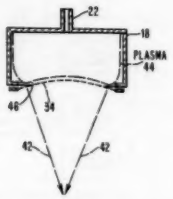
tential amplitude to vary inversely with constituent concentrations as they increase above said threshold level.

4,538,067

SINGLE GRID FOCUSSED ION BEAM SOURCE

Jerome J. Cuomo, Lake Lincolndale; James M. E. Harper, Yorktown Heights, and Gary A. Waters, Peekskill, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 9, 1982, Ser. No. 448,122
Int. Cl.³ H01J *3/14*
U.S. Cl. 250—396 R **23 Claims**



1. An ion beam system for producing a beam of ions, comprising in combination:

means for producing a plasma of charged ions,

a flexible multiapertured grid comprised of an electrically conducting material and located close to said plasma for extracting ions from said plasma and for accelerating said extracted ions, said grid being sufficiently flexible that it will bow toward said plasma by electrostatic attraction to said plasma, and

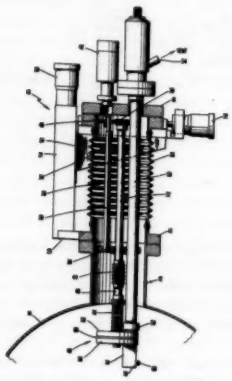
means for biasing said grid.

4,538,068

MANIPULATOR HAVING THERMALLY CONDUCTIVE ROTARY JOINT FOR TRANSFERRING HEAT FROM A TEST SPECIMEN

Steven J. Haney, Tracy; Richard H. Stulen, and Norman F. Toly, both of Livermore, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 3, 1983, Ser. No. 491,134
Int. Cl.³ G01N *21/00*
U.S. Cl. 250—443.1 **16 Claims**



1. A manipulator for rotating a material specimen in a high vacuum environment comprising:

a frame extending into the high vacuum environment;

a rotary shaft carried by the frame;

a first disc constructed of a first thermally conductive material rigidly supported by an end of the rotary shaft;

a specimen mount carried by the first disc for rotation therewith;

a second disc constructed of the first thermally-conductive material carried by the frame, said second disc being provided with a clearance hole for receiving the rotary shaft therethrough;

bearing means constructed of a second material which is thermally conductive interposed between and in contact with the first and second discs for facilitating rotary movement between the discs while maintaining thermal conduction between the discs;

means for cooling said second disc with a thermal media; and

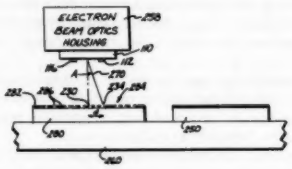
drive means for effectuating rotary movement to said rotary shaft whereby said specimen mount is rotated with said rotary shaft while maintaining a thermal conductive path from the mount through the first disc, the bearing means and the second disc.

4,538,069

CAPACITANCE HEIGHT GAGE APPLIED IN RETICLE POSITION DETECTION SYSTEM FOR ELECTRON BEAM LITHOGRAPHY APPARATUS

John R. Shambroom, Lexington, and Alan P. Sliski, Lincoln, both of Mass., assignors to Control Data Corporation, Minneapolis, Minn.

Filed Oct. 28, 1983, Ser. No. 546,760
Int. Cl.³ H01J *37/304*
U.S. Cl. 250—491.1 **1 Claim**



1. A method of detecting the position of a chrome-on-glass reticle in an electron beam lithography apparatus which includes an electron beam source in an electron beam housing, further comprised of a control system for controlling the angle of deflection of said electron beam, and a circuit substrate secured to the bottom of said electron beam housing, comprising the steps of:

positioning a calibration plate under said electron beam housing said calibration plate having an overlying conductive layer and a grid of spaced nonconductive points of known geometry formed into said conductive layer, one of said nonconducting points comprising an origination point, said origination point of said grid being aligned with the center line of said optics housing;

varying said deflection angle to deflect said electron beam from one of said nonconductive points of said grid to the next until said beam strikes a desired point, said desired point being spaced a specified distance from said origination point, the angle of deflection of said beam with respect to the center line of said optics housing when said beam strikes said desired point comprising a normal deflection angle;

measuring the distance between at least three sensor plates disposed on the bottom of said substrate and said calibration plate, each of said sensor plates being coupled to an associated measuring capacitor circuit, each of said sensor plates comprising the driven plate of a measuring capacitor and said calibration plate comprising the grounded plate of each of said measuring capacitors, each of said

measuring capacitor circuits generating a measuring capacitor signal representative of the distance between each sensor plate and said calibration plate;

processing each of said measuring capacitor signals into information defining the position of said calibration plate with respect to said sensors, said position of said calibration plate comprising a calibrated position for said reticle;

positioning said reticle under said electron beam housing and aligning an origination point on said reticle with said center line of said housing;

measuring the distance between each of said sensors and said reticle wherein each of said sensors comprises the driving plate of a measuring capacitor and said reticle comprises the grounded plate of said measuring

capacitors, each of said measuring capacitors generating a measuring capacitor signal representative of the distance between each sensor plate and said reticle;

processing each of said measuring capacitor signals into information defining the position of said reticle with respect to said sensors, said position comprising a reticle position;

comparing said reticle position with said calibrated position to determine the deviation of said reticle from said calibrated position; and

adjusting the angle of deflection of said electron beam from said normal deflection angle to a corrected deflection angle in response to said deviation information so that said electron beam is deflected said specified distance from said origination point on said reticle to strike said desired point on said reticle.

4,538,070

APPARATUS FOR TREATING DENTAL PROSTHETIC PARTS WITH RADIATION

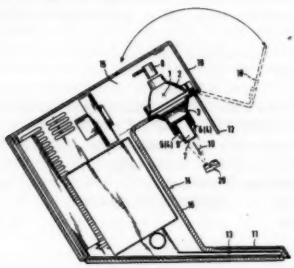
Wolf-Dietrich Herold, Hechendorf; Karl L. Grafwallner, Munich, and Michael Keller, Lochham, all of Fed. Rep. of Germany, assignors to ESPE Fabrik pharmazeutischer Praeparate GmbH, Fed. Rep. of Germany

Filed Jun. 3, 1983, Ser. No. 500,849

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1982, 3225589

Int. Cl.³ C08J *3/28*

U.S. Cl. 250—504 R **12 Claims**



1. An apparatus for treating dental prosthetic parts and materials with radiation of a selected spectral range, including

a source of radiation which comprises said selected spectral range,

reflecting means for directing radiation of said selected spectral range onto a location of treatment,

filter means substantially transmitting said selected spectral range, disposed between said source and said location of treatment, and

a non-contacting proximity switch for switching on said source, the switch being actuated by the presence of an object at said location of treatment.

4,538,071

PRACTICAL DEVICE FOR THE MEASUREMENT OF THE ABSORBED DOSE VERSUS DEPTH IN SOFT TISSUES

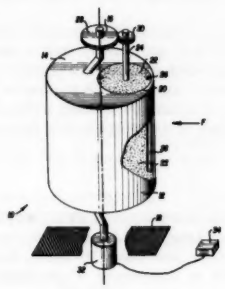
Raymond Bardoux, Neuilly, and Henri Joffre, Bourg-la-Reine, both of France, assignors to Commissariat a l'Energie Atomique and Merlin Gerin, both of, France

Filed Oct. 19, 1982, Ser. No. 435,330

Claims priority, application France, Oct. 27, 1981, 81 20282

Int. Cl.³ G01D *18/00*

U.S. Cl. 250—505.1 **5 Claims**



1. A device for irradiation measurement comprising a phantom representing a portion of the human body and having a cavity for housing a radiation detector, the phantom comprising a first rotary right cylinder having a first axis and a cylindrical housing with a second axis parallel and eccentric relative to said first axis of the first cylinder, a second revolution cylinder mounted for rotation in said cylindrical housing, said cavity being eccentrically accommodated in said second cylinder, and drive means for rotating the second cylinder in an opposite direction and by a rotation angle twice the rotation angle of the first cylinder for varying the depth of the detector in the phantom.

4,538,072

OPTICAL WAND FOR READING OCR CHARACTERS AND BAR CODE MARKS

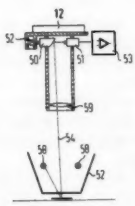
Josef Immler, Puchheim, and Cornelis van der Sel, Grafing, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 19, 1983, Ser. No. 486,587

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1982, 3214621

Int. Cl.³ G06K *7/10*

U.S. Cl. 250—568 **5 Claims**



1. An optical wand for automatic character recognition designed to be manually movable along a line of print of a data carrier for recognizing optical characters and bar code marks, respectively and including a scanner unit incorporating a light source for illuminating a scanning window via reflected light

and the portion of the data carrier appearing therein, an optical system and a sensing unit, said optical wand comprising:

a housing body having a nose section including a scanning tip with the optical system being located within the nose section, the housing body having a handle section adapted for manually gripping and angularly extending away from the nose section and the nose section includes a tip having an

aperture serving as the scanning window for the optical system commonly utilized for scanning of both optical characters and bar code marks and means for receiving the reflected light, and means for deflecting said reflected light; and

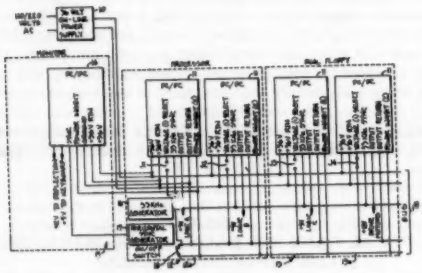
said sensing unit being arranged in said housing and being composed of first and second sensor devices, the first sensor device being arranged in alignment with said aperture for directly receiving one portion of reflected light and the second sensor device being arranged for receiving another portion of the reflected light from said deflecting means.

4,538,073

MODULAR POWER SUPPLY SYSTEM

Diab E. Freige, Los Altos; John J. Lockwood, San Jose; Michael Ramsay, Los Altos, and Leroy B. Keely, Sunnyvale, all of Calif., assignors to Convergent Technologies, Inc., Santa Clara, Calif.

Filed May 9, 1983, Ser. No. 493,103
Int. Cl.³ H02J *3/00*
U.S. Cl. 307—33 **16 Claims**



1. A modular programmable DC power supply for providing a designated DC output voltage to a computer system comprising:

a power module for producing a first fixed regulated DC voltage output;

a power bus coupled to said first DC voltage output; and

at least one DC-to-DC converter module coupled to said power bus to receive said first DC voltage from said power module and operable to convert said first DC voltage to a second regulated DC voltage at an output terminal, said DC-to-DC converter module including

an input terminal,

programmable reference means, coupled to said input terminal and responsive to an input on said input terminal, for producing one of a plurality of reference voltage values, and

voltage regulation means, coupled to said reference means and responsive to said reference voltage value, for selecting one of a plurality of values for said second DC voltage,

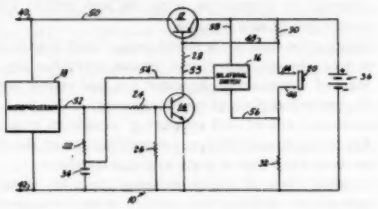
such that said DC power supply is generic in that the value of the second voltage at the output terminal for a computer system using said DC power supply is determined by the signal provided to said input terminal by the computer system.

4,538,074

POWER SWITCH

Jacob Fraden, Hamden, Conn., assignor to Healthcheck Corporation, Cheshire, Conn.

Filed Aug. 24, 1983, Ser. No. 525,864
Int. Cl.³ H01H *43/00;* **H03K** *17/28*
U.S. Cl. 307—126 **9 Claims**



1. In a power switch circuit of the type having a first transistor connected for switching power from a battery to an electronic instrument and a second transistor electrically connected to said first transistor for controlling said first transistor, the improvement comprising:

a momentary contact switch arranged so that its closure will turn said first transistor on when connected in a first power switch circuit configuration, and arranged so that its closure will turn said first transistor off when connected in a second power switch circuit configuration,

a bilateral switch electrically connected to place the power switch circuit into either of said first or second circuit configurations when said bilateral switch is deactivated or activated, respectively,

timing means responsive to turning on and off of said first transistor and having an output line connected to said second transistor, said timing means providing a first output signal to turn on the second transistor when the first transistor turns on and providing a second output signal to turn off the second transistor either when the first transistor turns off or after a predetermined time has elapsed, and

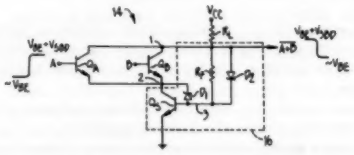
a capacitor coupled to said bilateral switch, said capacitor being connected to charge when the first transistor turns on to activate said bilateral switch and to discharge when said first transistor turns off to deactivate said bilateral switch.

4,538,075

HIGH SPEED REFERENCELESS BIPOLAR LOGIC GATE WITH MINIMUM INPUT CURRENT

Hemmige D. Varadarajan, Sunnyvale, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Sep. 7, 1983, Ser. No. 529,917
Int. Cl.³ H03K *17/04, 19/086*
U.S. Cl. 307—454 **9 Claims**



1. A logic gate having at least one input transistor means, each said input transistor means having a collector electrode connected to a first node, said first node being an output signal node, an emitter electrode connected to a second node and a

base electrode for receiving binary logic signal input, and said gate further having a load resistor between said first node and a supply voltage terminal, the improvement comprising:

means coupled to said second node and responsive to the voltage on said first node for controlling emitter current of said input transistor means through said second node to inhibit saturation of said input transistor means; and

means coulpled to said first node, and further coupled to said emitter current controlling means, for limiting the output voltage of said logic gate by clamping said output voltage to a maximum value.

4,538,076

LEVEL CONVERTER CIRCUIT

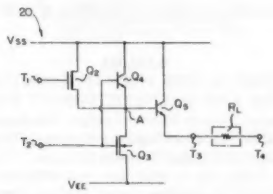
Hiroshi Shimada, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 28, 1982, Ser. No. 392,750

Claims priority, application Japan, Jun. 30, 1981, 56-102875

Int. Cl.³ H03K *19/092*

U.S. Cl. 307—475 **8 Claims**



1. A level converter circuit for converting a first logic signal, having a lower voltage supply as a base potential, into a second logic signal, having a higher voltage supply as a base potential, the level converter circuit comprising:

an input terminal for receiving the first logic signal;

an output terminal for outputting the second logic signal;

a first bipolar transistor having a collector operatively connected to the higher voltage supply, having an emitter and having a base;

a second bipolar transistor, having a collector operatively connected to the higher voltage supply, having an emitter operatively connected to said output terminal, and having a base operatively connected to said emitter of said first bipolar transistor; and

means, operatively connected to said input termjnal and said second bipolar transistor, for turning on only said second bipolar transistor or both said first and second bipolar transistors, in response to the logic level of the first logic signal, said turning on means including:

a first MOS transistor operatively connected in parallel with said first bipolar transistor; and

a second MOS transistor connected to the lower voltage supply and having a gate operatively connected to said base of said first bipolar transistor.

4,538,077

CIRCUIT UTILIZING JOSEPHSON EFFECT

Junichi Sone, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Sep. 8, 1982, Ser. No. 415,877

Claims priority, application Japan, Sep. 10, 1981, 56-142748; Sep. 10, 1981, 56-142749; Sep. 14, 1981, 56-145313

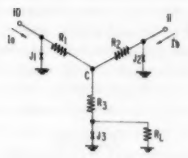
Int. Cl.³ H03K *19/195*

U.S. Cl. 307—476 **16 Claims**

1. A circuit utilizing a plurality of Josephson junctions each of which switches from a zero voltage state to a voltage state in response to a current greater than its respective critical current, said circuit comprising:

a first resistor, a second resistor and a third resistor having predetermined resistances R_1, R_2, R_3, respectively, each of said resistors having first and second ends and all of said resistors being connected together at said second ends thereof, said first ends of said first and second resistors receiving input currents and said first end of said third resistor providing an output current;

a first Josephson junction and a second Josephson junction having predetermined critical currents I_{01} and I_{02}, respectively, and connected between a reference potential and the first end of said first and second resistors, respectively; and



a specific Josephson junction having a predetermined critical current I_{03} and connected in series with said third resistor.

4,538,078

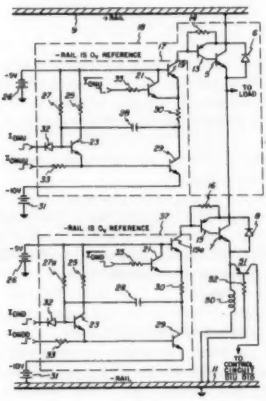
BASE DRIVE CIRCUIT CONTROLLER

George F. Pfeifer, Liverpool, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 4, 1983, Ser. No. 481,696

Int. Cl.³ H03K *17/16, 17/296*

U.S. Cl. 307—592 **3 Claims**



1. A base drive circuit controller for two base drive circuits, each of said base drive circuits connected to an upper and a lower series-connected power switch, respectively, said base drive circuit controller responsive to an external command signal indicative of desired conduction of said upper or lower power switch, said base drive circuit controller comprising:

a multistage shift register responsive to said external command signal so as to function as a pseudo random counter, said multistage shift register having a stable waiting state and a predetermined number of sequentially generated states which end in said stable state, said multistage shift register generating said sequential states when said external command signal transitions from indicating desired conduction of one of said switches to indicating desired conduction of the other of said switches;

decode circuit means responsive to predetermined ones of

said sequentially generated states for providing timing signals at predetermined times after said external command signal transitions from one amplitude to another;

logic means responsive to said timing signals and said external command signal, for providing control signals that begin and end at predetermined times corresponding to said predetermined ones of said sequentially generated states, respectively, to said base drive circuits corresponding to the upper and lower power switches dependent on said external command signal; and

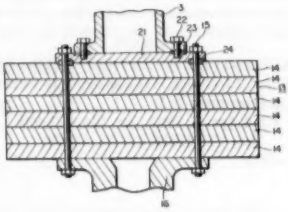
gating means coupling said external command signal to said multistage shift register only when said multistage shift register is in the stable waiting state.

4,538,079

FLYWHEEL DEVICE WITH COMPENSATION FOR NON PARALLEL PLATES

Taesuke Nakayama, Kobe, and Tadashi Konishi, Akashi, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 16, 1984, Ser. No. 600,403
Int. Cl.³ H02K *7/02*
U.S. Cl. 310—74 **5 Claims**



1. A flywheel device having a horizontal axis, comprising:

a plurality of flywheel discs axially stacked one upon the other, with a topmost disc on top of said discs having top surfaces substantially parallel to the horizontal axis of the flywheel device;

a first plurality of bolt means for tightening the plurality of flywheel discs together;

an adjustment disc arranged on top of the plurality of flywheel discs, said adjustment discs having a top surface parallel to the horizontal axis of the flywheel device and having a bottom surface in contact with a top surface of the topmost disc of the plurality of flywheel discs;

a shaft having a flange;

a second plurality of bolt means for connecting the flange of the shaft to the adjustment disc; and

radial knock pin means, arranged between the shaft and the adjustment disc, for transmitting torque from the shaft through the adjustment disc to the plurality of flywheel discs;

whereby the top surface of the adjustment disc corrects the accumulated dimensional error of the stacked plurality of flywheel discs from the horizontal axis of the flywheel device.

4,538,080

FLUX CONTOURED ROTARY ELECTROMAGNETIC MACHINE

Thomas R. England, Blacksburg, Va., assignor to Kollmorgen Technologies, Corporation, Dallas, Tex.

Filed Jun. 14, 1983, Ser. No. 504,071
Int. Cl.³ H02K *21/28*
U.S. Cl. 310—154 **8 Claims**

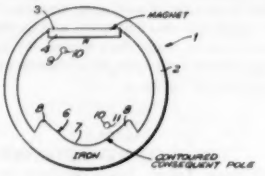
1. In a rotary electromagnetic machine, the combination of

a magnetic structure including

at least two poles,

a block permanent magnet providing one of said poles, with a nonuniform gap spacing, and

wherein the other one of said poles is a consequent pole structure; and at least one coil moving relative to said poles;



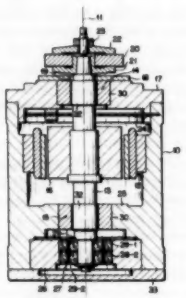
said consequent pole being contoured to provide a nonuniform gap spacing relative to said moving coil so that the sum of the flux densities encountered by said coil moving relative to said consequent pole and the other of said poles is substantially constant for portions of each revolution.

4,538,081

ELECTRIC MOTOR WITH HYDRODYNAMIC PRESSURE AND MAGNETIC THRUST BEARINGS

Masashi Kamiya, Tokyo; Mitsuo Sumiya, Yokohama, and Ryoji Yamaguchi, Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 7, 1983, Ser. No. 464,148
Claims priority, application Japan, Feb. 13, 1982, 57-20681
Int. Cl.³ F16C *17/16*; H02K *7/09*
U.S. Cl. 310—90 **3 Claims**



1. An electronic motor unit, comprising:

a spindle having a journal with a number of grooves extending parallel to one another along the rotation axis of the spindle, each of said grooves having an arcuate cross section;

a rotor mounted on the spindle to rotate therewith;

a stator for rotating the rotor;

a bearing of a hydrodynamic pressure type, receiving the journal and having an inner surface facing the outer surface of the journal with a gap therebetween;

a motor housing on which the bearing and the stator are fixed;

a magnetic thrust bearing section including an even number of superposed rotor magnets fixed to the spindle, each having an outer surface, and including an equivalent number of stator magnets in which the rotor magnets are inserted, the stator magnets being superposed and fixed to the housing, each of said stator magnets having an inner surface facing the outer surface of the corresponding rotor magnet with a gap therebetween, the rotor and stator

magnets having magnetic poles of opposite polarity on their outer and inner surfaces facing each other; wherein during rotation of said journal, gas flows into said gap formed between said journal and said bearing to thereby produce hydrodynamic pressure.

4,538,082

HIGH-OUTPUT MAGNETIC FIELD TRANSDUCER

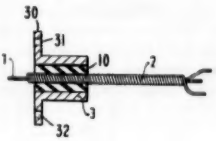
Walter Hinke, Ludwigsburg, and Harry Kaiser, Markgröningen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 18, 1982, Ser. No. 389,585

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1981, 3128031

Int. Cl.³ H02K *21/00*

U.S. Cl. 310—152 **4 Claims**



1. High-output magnetic field transducer, particularly for a contactless ignition signal system for use with an internal combustion engine, having

a mechanically treated ferro-magnetic Wiegand element (1) which abruptly changes its magnetization when exposed to a magnetic field of changing polarity,

and a pick-up coil (2) surrounding the Wiegand element, and comprising, in accordance with the invention, a flux concentration element (3, 3*a*, 3*b*, 3*c*, 3*d*, 4, 5, 6, 7) surrounding, at least in part, said Wiegand element (1) along at least a longitudinal portion thereof and being magnetically coupled to the pick-up coil, the flux concentration element comprising highly magnetically permeable material having a magnetization direction changeable in response to the magnetization of said Wiegand element (1); and

wherein said flux concentration element (3, 3*a*, 3*b*, 3*c*, 3*d*, 4, 5, 6) comprises a tubular structure.

4,538,083

ROTOR/STATOR WINDING AND METHOD AND APPARATUS FOR PRODUCING SAME

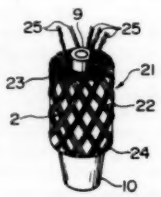
Yoshikuni Nozawa, Nagano, Japan, assignor to Entac Company, Limited, Japan

Filed Jul. 7, 1983, Ser. No. 511,687

Claims priority, application Japan, Jul. 7, 1982, 57-118015; Aug. 26, 1982, 57-147989; Aug. 26, 1982, 57-147990; Nov. 25, 1982, 57-206412; Nov. 25, 1982, 57-206413; Nov. 25, 1982, 57-206414; Nov. 29, 1982, 57-208995

Int. Cl.³ H02K *3/00*

U.S. Cl. 310—198 **12 Claims**



1. A cup-shaped winding for motors, said cup-shaped winding having a cylindrical shape and having a substantially closed end defined by a shoulder portion, a substantially open end defined by a peripheral portion and an intermediate cylindrical portion between said shoulder and peripheral portions, said winding comprising a plurality of bands of wire wound at a predetermined angle with respect to a center axis of said cylindrical shape, said bands of wire being displaced with respect to one another about the circumference of said cup-shaped winding and overlapping one another at said closed end to form a bow string portion comprising said shoulder portion, overlapping at said open end to form said peripheral portion and overlapping between said bow string and peripheral portions to form an inclined portion comprising said intermediate portion, each of said bands of wire extending in said peripheral portion for a predetermined distance in a substantially circumferential direction of said cylindrical shape and perpendicular to a line parallel to said center axis.

4,538,084

STATOR OF MOTOR

Shigeki Kawada, Hino; Yoichi Amemiya; Masatoyo Sogabe, both of Hachioji, and Noboru Iwamatsu, Hino, all of Japan, assignors to Fanuc Ltd., Tokyo, Japan

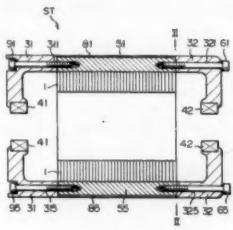
PCT No. PCT/JP83/00275, § 371 Date Apr. 20, 1984, § 102(e) Date Apr. 20, 1984, PCT Pub. No. WO84/01061, PCT Pub. Date Mar. 15, 1984

PCT Filed Aug. 24, 1983, Ser. No. 604,354

Claims priority, application Japan, Aug. 26, 1982, 57-146797

Int. Cl.³ H02K *1/06*

U.S. Cl. 310—217 **4 Claims**



1. A stator of a motor having a stator core consisting of laminated magnetic core sheets, wherein:

through holes are bored at predetermined positions of the stator core, reinforcing bars are inserted into said through holes along with being fixed to said stator core by welding,

said stator core is supported between a front bracket and a rear bracket, and

tap bolts penetrate said front bracket and said rear bracket, and are screwed with internal threads at the end of said reinforcing bars, thereby fixing in place said stator core, said front bracket, and said rear bracket.

4,538,085

MAGNETO-TVPE D-C ELECTRIC MOTOR

Toshinori Tanaka, Hin.eji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 6, 1983, Ser. No. 482,554

Claims priority, application Japan, Apr. 8, 1982, 57-52118[U]; Nov. 2, 1982, 57-167204[U]

Int. Cl.³ H02K *13/00*

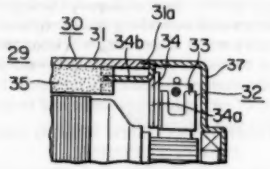
U.S. Cl. 310—239 **3 Claims**

1. A magneto-type D-C electric motor comprising:

a cylindrical yoke having first engaging portions;

field poles including permanent magnets having second engaging portions, adhered to the inner peripheral surface of said yoke;

an armature opposed to said field poles in the radial direction with respect to the axis of rotation of said armature;
a bracket coupled to said yoke, surrounding and rotatably supporting said armature;
brushes in slidable contact with said armature to supply electric power thereto;



a brush holder secured to said bracket and holding said brushes; and
an engaging member having a disk portion secured to said brush holder, integral projecting portions fitted to said second engaging portions, and a circumferential portion engaging said first engaging portions and said bracket.

4,538,086

STATOR FOR AN ELECTROMAGNETIC MACHINE

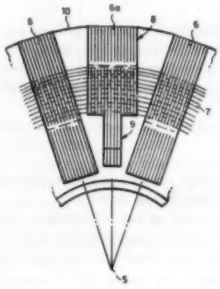
John D. Marsh, Waterloo, Belgium, and Craig A. Nazzer, Sydney, Canada, assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 17, 1984, Ser. No. 605,954

Claims priority, application United Kingdom, May 3, 1983, 8311997

Int. Cl.[3] **H02K** *1/12*

U.S. Cl. 310—258 **2 Claims**



1. A stator of an electromagnetic machine, comprising:
a stator frame having a central axis;
an annular coil wound on said frame;
a plurality of U-shaped pole pieces mounted on said frame in straddling relationship to said coil and opening radially outwardly from said axis;
a plurality of U-shaped pole pieces mounted on said frame in straddling relationship to said coil and opening radially inwardly from said axis;
adjacent ones of said pole pieces opening in opposite radial directions from said axis; and
said radially inwardly opening pole pieces having a radially inner portion and a radially outer portion, said radially outer portion and a radially inwardly opening pole pieces having a cross-sectional area greater than the cross-sectional area of said radially outwardly opening pole pieces, and said radially inner portion of said radially inwardly opening pole pieces having a cross-sectional area less than the cross-sectional area of said radially outwardly opening pole pieces.

4,538,087

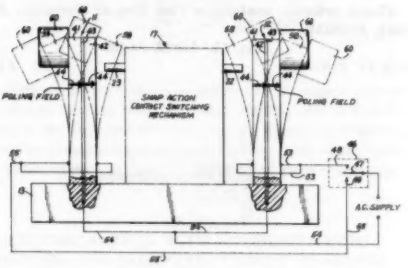
ALTERNATING CURRENT DRIVEN PIEZOELECTRIC LATCHING RELAY AND METHOD OF OPERATION

Carmen P. Germano, and John M. Davenport, both of Lyndhurst, Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 11, 1984, Ser. No. 619,673

Int. Cl.[3] **H01L** *41/08*

U.S. Cl. 310—332 **42 Claims**



1. An alternating current latching relay including in combination at least one electrically actuated piezoelectric drive member, a latching type snap-action switch mechanism having a set of electrical contacts that are selectively latched either in the open or the closed condition in a snap-action manner upon successive actuations of the switch mechanism, operating push rod means for actuating the snap-action switch mechanism and engageable by the free end of the piezoelectric drive member whereby movement of the piezoelectric drive member selectively operates the snap-action switch mechanism, and selectively operable alternating current electric excitation circuit means connected to said piezoelectric drive member for selectively electrically exciting the piezoelectric element thereof with an alternating current electric excitation field whereby the piezoelectric drive member is caused to mechanically resonate and to repeatedly strike the engageable end of the push rod means with sufficient force to selectively actuate the snap-action switch mechanism to the opposite one of its two operating conditions from that in which it had been initially set.

4,538,088

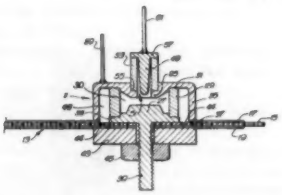
SPARK GAP DEVICE

Edgar W. Malone, Goleta, Calif., assignor to Reynolds Industries, Inc., Los Angeles, Calif.

Filed Aug. 11, 1983, Ser. No. 521,985

Int. Cl.[3] **A47B** *88/00*

U.S. Cl. 313—325 **5 Claims**



1. A spark gap device comprising:
first and second circumferentially-symmetrical electrodes;
a hollow-cylindrical insulator for positioning the first and second electrodes in a confronting relationship, a predetermined distance apart from each other, and for defining

a closed chamber that includes the space between the electrodes;

an elongated shaft projecting from the side of the first electrode opposite the second electrode, the shaft being threaded and electrically conductive;

an electrically-conductive washer encircling the shaft and having a flat, ring-shaped surface that faces the first electrode;

an electrically-conductive retaining nut threadedly engaging the shaft and retaining the washer; and

an electrically-conductive cylindrical wall projecting from the second electrode and surrounding the cylindrical insulator, the wall terminating in a flat, ring-shaped surface coaxial with the flat, ring-shaped surface of the washer, the two surfaces having substantially the same outer diameters and confronting each other in spaced relationship;

wherein the washer and cylindrical wall are sized and located to permit placement of a flat, two-conductor foil strip transmission line between their respective confronting ring-shaped surfaces, with one surface contacting a first foil conductor of the transmission line and the other surface contacting a second foil conductor of the transmission line.

4,538,089

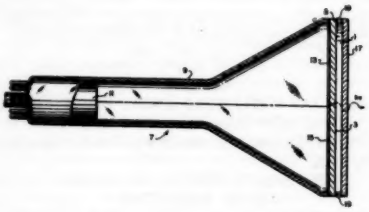
GREEN LUMINESCENT CATHODE-RAY TUBE DEVICE WITH IMPROVED COLOR FILTERING SYSTEM

Brian J. Fitzpatrick, Ossining, N.Y., assignor to North American Philips Corporation, New York, N.Y.

Filed Nov. 2, 1983, Ser. No. 548,065

Int. Cl.³ H01J *31/00, 5/16*

U.S. Cl. 313—478 **15 Claims**



1. A cathode-ray tube device for generating a bright green light spot comprising;

a cathode-ray tube including an evacuated envelope, means, located within said envelope, to generate an electronic beam, a terbium activated phosphor, capable of emitting radiation when excited by electrons, positioned within said envelope and in the path of said electron beam and a transparent face plate forming part of said envelope is situated in the path of said green radiation, and positioned outside of the outer surface of said face plate and in the path of said green radiation, a light beam filtering means comprising in a container which at least in the path of said green radiation is transparent to said radiation, a concentrated solution of a soluble praseodymium salt, sodium fluorescein and Fast Green FCF.

4,538,090

LAMP/REFLECTOR UNIT

Dieter Wilhelm, Eschweiler, Fed. Rep. of Germany, and Volker Kuhnert, Kerkrade, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 7, 1979, Ser. No. 46,581

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1978, 2825666

Int. Cl.³ H01J *5/16*

U.S. Cl. 313—578 **2 Claims**

1. An automobile lamp/reflector unit having a concave reflector member and a lens member attached thereto for supporting an associated light bulb in spaced relation to the reflecting surface of said reflector member, the associated light bulb having a pinch seal at one end thereof which is substantially rectangular in cross-section and from which current conductors extend which are in electrical contact with a filament disposed within the light bulb, each of said current conductors being attached to a respective support wire, said reflector member having at least two mutually electrically insulated contact members, each of said support wires being attached to respective contact members, characterized in that the pinch seal is secured between two opposed metal mounting clips, each clip engaging in a clamping manner around a respective narrow side face of the pinch seal, each support wire being secured to a respective metal mounting clip, each clip being generally U-shaped and having side limbs and a base and being formed from a resilient metal strip, each of said side limbs of said clip sloping inwardly from the base of the U to a region where they engage a respective major surface of the pinch seal.

4,538,091

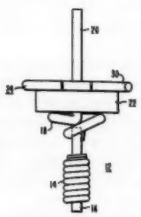
HIGH-PRESSURE SODIUM LAMP SPRING CLIP CROSS PIECE FOR ELECTRODE AND END PLUG SUPPORT

George A. Lewis, Bath; Kent L. Collins, Hammondsport; Joseph C. Benesh, Bath, all of N.Y., and Patrick C. Ward, Sparta, N.J., assignors to North American Philips Lighting Corp., New York, N.Y.

Filed Feb. 16, 1983, Ser. No. 466,810

Int. Cl.³ H01J *9/40*

U.S. Cl. 313—625 **4 Claims**



3. In an electric discharge lamp arc tube assembly including a ceramic arc tube, a pair of discharge electrodes within said arc tube each adjacent a respective one of the arc tube ends, and a pair of arc tube end closures closing the respective ends of said arc tube, the improvement comprising: at least one of said end closures comprising a ceramic plug having a pair of flat major end surfaces and a central bore extending through said ceramic plug between said pair of flat major surfaces; a conductive electrode support for supporting one of said dis-

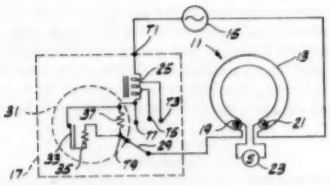
charge electrodes adjacent said ceramic plug; a conductive lead wire extending through said central bore and connected to said electrode support; and a refractory metal clip connected to said lead wire outside the arc tube assembly and against the outer major surface of said ceramic plug, said metal clip having an end bend and a pair of legs having generally parallel portions having lengths greater than the radius and less than the diameter of said ceramic plug and extending away from said end bend; and said legs having diverging end portions that diverge away from each other, the total length of each of said legs being greater than the diameter of said ceramic plug, one of said clip legs having a surface indentation facing the other of said clip legs with the space between the clip legs at the indentation being less than the diameter of said lead wire, said lead wire extending between said clip legs at said indentation and being frictionally retained therebetween with said clip against the outer major surface of said ceramic plug, the clip end bend and clip leg ends extending beyond the plug for limiting the depth of insertion of said plug into said arc tube, and the clip end bend and clip legs lying in a plane with the clip end bend and clip leg ends defining at least three points of contact with said arc tube.

4,538,092

DIMMER AND STARTING CIRCUITS FOR A FLUORESCENT LAMP

Charles D. Goralnik, 200 Bryn Wyck Pl., St. Louis, Mo. 63141

Filed Jun. 27, 1983, Ser. No. 507,741
Int. Cl.³ H01J *7/44*
U.S. Cl. 315—58 **16 Claims**



1. A dimmer for a fluorescent lamp adapted to be connected between one terminal of a power source and a first filament of the fluorescent lamp, the other terminal of said power source being connected to the second filament of the lamp, and a starting switch interconnecting said first and second filaments for opening the circuit therebetween when the filaments are sufficiently heated, said dimmer comprising:

ballast inductor means for providing impedances of various values, said ballast inductor means being adapted for connection between said one power source terminal and said first filament;

impedance adjusting means for effecting connection of one value of impedance to the first filament of the fluorescent lamp in a first position thereof and for effecting connection of a second value of impedance to said first filament of the fluorescent lamp in a second position thereof, each of said values of impedance being such as will allow a current sufficient to start the fluorescent lamp to pass therethrough; and

means for increasing the impedance provided by the ballast inductor means, once starting of the fluorescent lamp has occurred, to reduce the current from a level sufficient to start the fluorescent lamp to a level below the minimum current required to start the fluorescent lamp but above the minimum required to maintain the lamp emission once started, the last said means being adapted to be connected in series with the ballast inductor means between said first filament and said one power source terminal, whereby the light intensity level of the fluorescent lamp during operation is reduced below that which would be produced at a current corresponding to the minimum starting current of the lamp.

4,538,093

VARIABLE FREQUENCY START CIRCUIT FOR DISCHARGE LAMP WITH PREHEATABLE ELECTRODES

Henri A. I. Melai, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 10, 1982, Ser. No. 376,808
Claims priority, application Netherlands, May 14, 1981, 8102364
Int. Cl.³ H05B *37/00, 39/00, 41/36*
U.S. Cl. 315—219 **17 Claims**

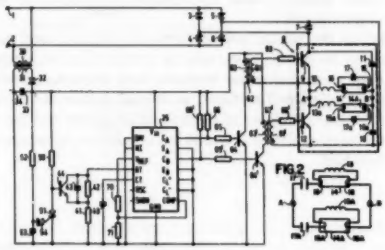


FIG.2

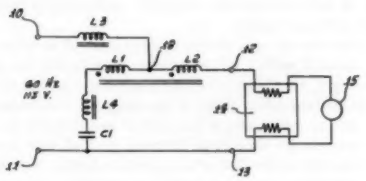
1. An electric arrangement for starting and supplying an electric discharge lamp having two preheatable electrodes comprising, in the connected condition of the lamp, means connecting an inductive element, one of the lamp electrodes, a capacitive element and the other lamp electrode in a series arrangement such that one of said elements is in series with the lamp and the other one of said elements is in parallel with the lamp, means connecting said series arrangement between two output terminals of an auxiliary device, said auxiliary device including means for generating an alternating voltage and means for varying the frequency thereof after switch-on of the electric arrangement from an initial frequency to a lamp operating frequency independent of lamp current, the inductive element and the capacitive element having a series resonant frequency falling between the initial frequency and the lamp operating frequency, and means coupling the alternating voltage to the two output terminals of the auxiliary device.

4,538,094

LAMP BALLAST WITH NEAR UNITY POWER FACTOR AND LOW HARMONIC CONTENT

Lloyd J. Perper, Tucson, Ariz., assignor to Iota Engineering Co., Tucson, Ariz.

Filed Aug. 12, 1983, Ser. No. 522,505
Int. Cl.³ H05B *37/02*
U.S. Cl. 315—221 **9 Claims**



1. A ballast circuit for a fluorescent lamp, comprising in combination:

means defining first and second line terminals;

means defining first and second load terminals, with said

second line terminal connected to said second load terminal;

first, second and third inductances connected at a junction; and

a capacitance connected in series with said first inductance between said junction and said second line terminal, with said second inductance connected to said first load terminal and said third inductance connected to said first line terminal;

with the magnitudes of said first inductance and said capacitance selected to be a series resonant circuit at a frequency of about three times the frequency of the line voltage connected at said line terminals.

4,538,095

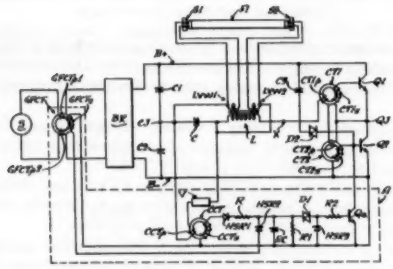
SERIES-RESONANT ELECTRONIC BALLAST CIRCUIT

Ole K. Nilssen, Caesar Dr., Rte. 5, Barrington, Ill. 60010

Filed Jun. 3, 1983, Ser. No. 500,841

Int. Cl.³ H05B *37/00*

U.S. Cl. 315—244 **13 Claims**



1. A ballast for a gas discharge lamp, said lamp having a pair of electrodes and requiring thereacross in order to initiate lamp operation an initial relatively high-magnitude lamp starting voltage for a relatively brief period of time, said ballast being adapted to be powered from an ordinary electric utility power line and comprising:

rectifier-means connected in circuit with said power line by way of a pair of power-line-wires and operative to provide a DC voltage;

inverter-means connected with said DC voltage and operative to provide a high-frequency-voltage at an AC output, said high-frequency-voltage having a fundamental frequency that is substantially higher than that of the voltage normally present on said power line;

tuned-circuit-means connected in circuit with said AC output, said tuned-circuit-means being substantially resonant at the fundamental frequency of said high-frequency-voltage and having a pair of output terminals with a tuned-circuit-voltage thereacross, the presence of said tuned-circuit-voltage being a response to the presence of said high-frequency-voltage;

lamp-socket-means connected in circuit with said pair of output terminals and operable to permit disconnectable connection of said gas discharge lamp therewith;

disable-means connected in circuit with said inverter-means and operable, upon the receipt of a disable-signal, to disable the operation of said inverter-means, thereby to remove said tuned-circuit-voltage from said pair of output terminals;

voltage-sensing-means connected in circuit with said pair of output terminals and operable to provide said disable-signal to said disable-means whenever the magnitude of said tuned-circuit-voltage has remained at or above a predetermined level for a time longer than a certain first length of time, said pre-determined level being of a magnitude at least equal to that of said relatively high-magnitude lamp starting voltage and said certain first length of time being at least equal in length to that of said relatively brief period of time; and

current-sensing-means operative to sense the flow of high-frequency-current through said pair of power-line-wires and to provide said disable-signal to said disable-means whenever said high-frequency-current has been flowing for a time longer than a certain second length of time, said high-frequency-current having a fundamental frequency that is substantially the same as that of said high-frequency-voltage.

4,538,096

SPEED CONTROL CIRCUIT FOR A DC MOTOR

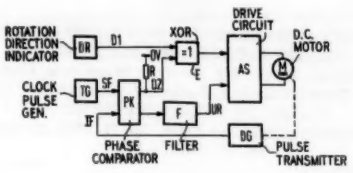
Hans Kern, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 12, 1984, Ser. No. 680,850

Claims priority, application Fed. Rep. of Germany, Jan. 4, 1984, 3400198

Int. Cl.³ H02P *5/16, 5/06*

U.S. Cl. 318—314 **5 Claims**



1. A speed control circuit for a DC motor comprising:

a drive circuit connected to said motor for supplying current thereto, said drive circuit having first and second control inputs;

a means connected to said motor for generating an actual rotation frequency signal;

a means for generating a theoretical frequency signal;

a comparator having respective inputs to which said actual frequency signal and said theoretical frequency signal are supplied, said comparator generating a second rotation direction signal at a first output connected to said first contol input and generating a reference voltage proportional to the amount of phase difference between said theoretical frequency signal and said actual frequency signal at a second output of said comparator; and

a filter having an input connected to said second output of said phase comparator, and having an output connected to said second control input of said drive circuit for controlling said drive circuit in response to said reference voltage.

4,538,097

PROCESS AND APPARATUS FOR RECOVERING ENERGY, IN THE FORM OF ELECTRIC ENERGY, FROM A MOTOR TEST BENCH

Aubert Tourneur, deceased, late of Pontault Combault, France (by Monique Tourneur, legal representative), assignor to Appareillages et Materiels de Servitudes, Fresnes, France

Filed Dec. 30, 1981, Ser. No. 335,769

Claims priority, application France, Dec. 30, 1980, 80 27813

Int. Cl.³ G01L *3/00*

U.S. Cl. 318—490 **26 Claims**

1. An apparatus for recovering energy, in the form of electrical energy, from an engine on a test bench comprising:

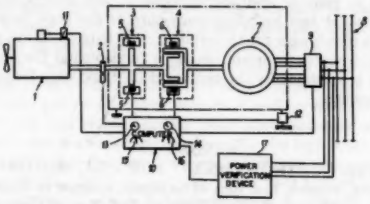
(a) brake means for applying a braking torque to an output shaft of the engine;

(b) electrical power generating means for connection to a distribution network to be supplied;

(c) variable-speed electromagnetic coupling means for cou-

pling said output shaft to said electrical power generating means; and

(d) a controller for continuously monitoring and controlling



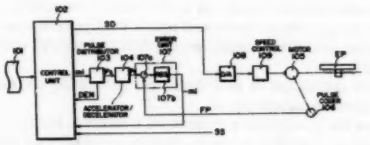
said brake means and said variable-speed electromagnetic coupling means for apportioning the power produced by the engine between said coupling means and said brake means as a function of the power produced by the engine.

4,538,098

METHOD AND APPARATUS FOR CONTROLLING ELECTRIC DISCHARGE MACHINE

Mitsuo Matsui, Tokyo, and Teruyuki Matsumura, Hachioji, both of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

Filed Jul. 16, 1982, Ser. No. 398,902
Claims priority, application Japan, Jul. 21, 1981, 56-114059
Int. Cl.³ B23P *1/08*
U.S. Cl. 318—567 **19 Claims**



1. A method of controlling an electric discharge machine wherein a motor, for establishing relative movement between an energized electrode and a workpiece, is driven in accordance with command data in order to machine the workpiece to a desired shape by an electric discharge produced between the electrode and workpiece, the electric discharge machine including a memory, counting means and a sensor, said method comprising the steps of:

(a) entering the command data;

(b) storing in the memory retraction control information contained in the entered command data;

(c) moving the electrode in an advancing direction relative to the workpiece by controlling the speed of the motor in accordance with machining feed speed information contained in the entered command data;

(d) monitoring the current position of the electrode by counting, via the counting means, sensor pulses generated by the sensor whenever the motor rotates by a predetermined amount;

(e) moving the electrode substantially immediately in a retracting direction relative to the workpiece by reading in a retraction speed from the retraction control information stored in the memory and controlling the speed of the motor on the basis of the retraction speed, when a signal indicative of a short circuit is generated; and

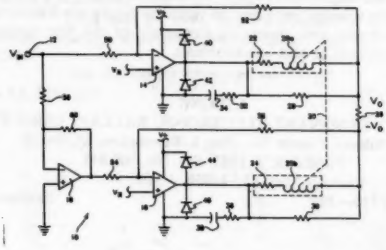
(f) moving the electrode in the advancing direction relative to the workpiece by reading in a re-advancing speed from the retraction control information stored in the memory, when a signal indicative of an end to the short circuit is generated.

4,538,099

AMPLIFIER CIRCUIT

Ronald R. Moon, Santa Clara, Calif., assignor to Quantum Corporation, Milpitas, Calif.

Filed Jan. 17, 1983, Ser. No. 458,450
Int. Cl.³ G05F *1/00*
U.S. Cl. 318—678 **8 Claims**



1. A driver amplifier circuit for an electromechanical position translator having two low impedance coils of substantially equal inductance and resistance, said amplifier circuit comprising

input means for providing a control voltage V_{in} and for providing a control voltage $-V_{in}$ representing desired translator position;

said two coils being series connected, and a very low ohmic value reference resistor connected in series between said coils to form a $+V_{out}$ node and a $-V_{out}$ node,

a pair of differentially driven push pull amplifier means connected between ground and supply potential, one of said pair having an input connected to said $+V_{in}$ voltage and to a reference source voltage V_{ref} and the other of said pair having an input connected to said $-V_{in}$ voltage and to said reference source voltage V_{ref} and having outputs connected to drive said coils, one of said pair connected to one of said coils and the other of said pair connected to the other of said coils;

two equal, high ohmic value feedback resistors, one thereof being connected from said $+V_{out}$ node to an inverting input of one of said amplifier pair and the other thereof being connected from said $-V_{out}$ node to an inverting input of the other of said differentially driven push pull amplifier pair means;

whereby current passing through said coils is substantially proportional to said input control voltage within a range of linearity and operating frequency of said circuit.

4,538,100

DC TO AC INVERTER AND MOTOR CONTROL SYSTEM

William J. Tuten, Scottsdale; Kennith D. Crosby, Carefree, and Bertil R. Bergquist, Mesa, all of Ariz., assignors to Creative Technology, Inc., Scottsdale, Ariz.

Filed Mar. 10, 1980, Ser. No. 128,858
Int. Cl.³ H02P *5/40*
U.S. Cl. 318—808 **7 Claims**

1. A DC to AC inverter system, comprising:

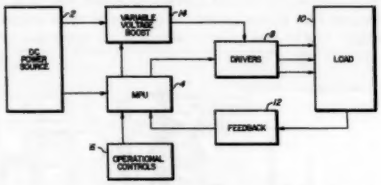
microprocessing means;

a first plurality of counting means each coupled to said microprocessing means for receiving data therefrom and for generating a plurality of square wave signals;

a second plurality of driver means, each one of which is coupled to a different one of said first plurality of counting means for receiving the square wave signals generated thereby and deriving therefrom one phase of a multiphase AC signal; and

first means coupled to said microprocessor means for vary-

ing the frequency of each phase of said multiphase signal by varying the contents of each of said first plurality of



counting means associated with each of said second plurality of driver means.

4,538,101

POWER SUPPLY DEVICE

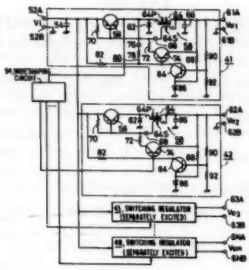
Tetsuhiko Shimpo, and Isao Fujihata, both of Tokyo, Japan, assignors to Nippon Chemi-Con Corporation, Tokyo, Japan

Filed Jun. 3, 1983, Ser. No. 500,672

Claims priority, application Japan, Jun. 4, 1982, 57-95980; Aug. 14, 1982, 57-123342[U]; Sep. 6, 1982, 57-154882

Int. Cl.³ G05F *1/46*

U.S. Cl. 323—272 **7 Claims**



1. A power supply device, comprising: a plurality of switching regulators; and a waveshaping circuit for shaping switching pulses generated within one of said switching regulators and for supplying the shaped output of said waveshaping circuit to the others of said switching regulators as an input reference waveform in order to synchronize the switching operations of the rest of said switching regulators, the output of each of said switching regulators supplying a different load.

4,538,102

POWER SUPPLY CIRCUIT

Masayuki Takagi, Kawasaki; Hiroshi Mugiya, Tama, and Shigeru Komaju, Sendai, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 6, 1983, Ser. No. 529,637

Claims priority, application Japan, Sep. 10, 1982, 57-157700; Oct. 29, 1982, 57-172349

Int. Cl.³ G05F *1/48*

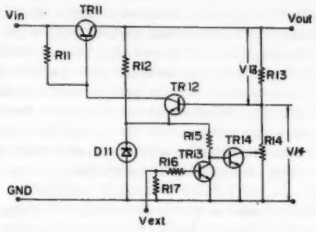
U.S. Cl. 323—349 **14 Claims**

1. A power supply circuit receiving an external control signal, comprising:

an output transistor having a base and outputting a stabilized voltage;

a control transistor, operatively connected to the base of said output transistor, having a base and controlling the base potential of said output transistor;

impedance means, operatively connected to the base of said control transistor, for dividing the stabilized voltage and applying a divided voltage to the base of said control transistor; and



switching means operatively connected to said impedance means and to receive the external control signal, for varying the division ratio of said impedance means.

4,538,103

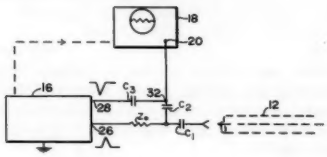
TIME DOMAIN REFLECTOMETER APPARATUS FOR IDENTIFYING THE LOCATION OF CABLE DEFECTS

John Cappon, 1 Cathcart St., Willowdale, Ontario, Canada (M2M 1E8)

Filed Aug. 30, 1982, Ser. No. 412,866

Int. Cl.³ G01R *27/04, 31/08*

U.S. Cl. 324—52 **8 Claims**



1. A time domain reflectometer apparatus for testing a cable and for cooperation with an oscilloscope or other display apparatus which comprises:

means for generating a first plurality of pulses which are positive going;

means for generating a second plurality of pulses which are negative going and which are each synchronized with one of said positive going pulses;

means for applying at least one of said pluralities of pulses to the cable being tested;

means for cooperation with the associated display apparatus for providing a display of at least reflected pulses from the cable being tested;

means for bucking said positive going pulses with said negative going pulses to minimize the amplitude displayed of the pulses being supplied to the cable being tested; and

means for delaying at least some of said pulses for substantially synchronizing said negative going pulses and said positive going pulses.

4,538,104

IN-CIRCUIT TEST APPARATUS FOR PRINTED CIRCUIT BOARD

Bruce S. Douglas, San Jose, and Chester V. Westergart, Scotts Valley, both of Calif., assignors to Test Point 1, Inc., San Jose, Calif.

Filed Apr. 11, 1983, Ser. No. 483,696

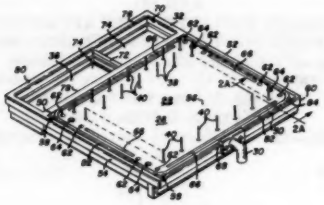
Int. Cl.³ G01R *31/02*

U.S. Cl. 324—158 F **17 Claims**

1. An in-circuit test apparatus for printed circuit boards, comprising in combination:

a baseplate having a first and second section, said first section including a top surface having a continuous groove about a baseplate edge forming a vertical outer wall, said groove having molded rounded interior corners, a channel slot with a cylindrical cavity at each end and an external penetration through said vertical outer wall, and further including a bottom surrounded by said vertical outer wall having at least one baseplate penetration adjacent to each of said rounded interior corners, said baseplate penetration piercing a shallow rectangular recess having a first threaded receptacle within the baseplate bottom, said second section including an outer frame molded to said first section, said outer frame including a hinge for connecting said outer frame to a tester interface;

a top plate mounted atop said first section forming a chamber therebetween and having a flat, smooth upper surface, and a bottom surface with a center portion having peripheral edges and including an array of standoff stops distributed about said bottom center portion, and at least a single guide shaft for aligning the top plate with said base pene-



tration and having contoured corners symmetrically matching said rounded interior corners of the baseplate;

a vacuum inlet fitted to said external penetration through the baseplate vertical outer wall for creating a vacuum within said chamber;

a first vacuum seal held captive between the top plate and the baseplate and within said continuous groove, the vacuum seal being closed upon itself and sealing said rounded interior corners of the baseplate and said contoured corners of the top plate for maintaining said vacuum within said chamber; and

a bearing block assembly having an adjustable mounting block in physical communication with each of said shallow rectangular recesses within said baseplate bottom and a linear bearing pressed into said block and passing through one of said baseplate penetrations and further comprising a second threaded receptacle located within said guide shaft, said guide shaft passing through said bearing and said block for independently adjusting the top plate relative to the baseplate.

4,538,105

OVERLAY TEST WAFER

Christopher P. Ausschnitt, Southport, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Continuation-in-part of Ser. No. 327,862, Dec. 7, 1981, Pat. No. 4,437,760. This application Apr. 28, 1983, Ser. No. 489,641

Int. Cl.[3] **G01R** *27/14;* **H01L** *21/66*

U.S. Cl. 324—158 R **14 Claims**

1. A test wafer for testing the overlay alignment of a second level pattern over a first level pattern for testing lithographic equipment used in making microcircuits comprising:

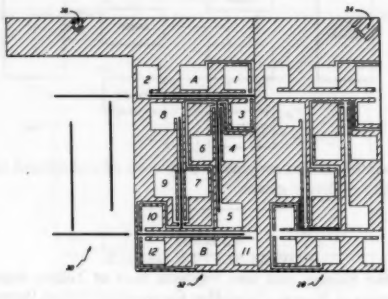
a first conductor, means for measuring the conductance of said first conductor;

a second conductor, means for measuring the conductance of said second conductor;

a third conductor, means for measuring the conductance of said third conductor;

a fourth conductor, means for measuring the conductance of said fourth conductor;

said conductors being constructed and arranged so that the conductance of the first conductor with respect to the



second conductor, and the conductance of the third conductor with respect to the fourth conductor is indicative of the offset of said first level pattern with respect to said second level of pattern.

4,538,106

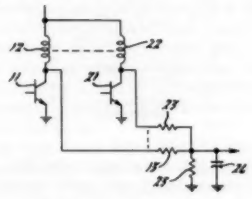
OUTPUT TRANSISTOR DRIVER DIAGNOSTIC SYSTEM

Robert L. Anderson, Saline, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jun. 13, 1983, Ser. No. 503,924

Int. Cl.[3] **G01R** *31/26;* **G08B** *21/00*

U.S. Cl. 324—158 T **2 Claims**



1. An apparatus for diagnosing the operation of a plurality of output transistor drivers of an electronic engine control module including:

a plurality of detection resistors, each detection resistor having a magnitude of about 100,000 ohms and being coupled from a collector of one output transistor driver to a common node;

a reference resistor, having a magnitude of about 3000 ohms, coupled between said common node and a ground potential; and

a voltage detector coupled to said common node for measuring voltage to determine whether the voltage is within predetermined limits and thereby to determine the existence of an improperly functioning transistor driver.

4,538,107

CABLE FAILURE DETECTION SYSTEM

Richard B. Varone, 81 Hilltop Dr., Smithtown, N.Y. 11787

Filed Jan. 10, 1983, Ser. No. 456,544

Int. Cl.[3] **G01B** *7/04*

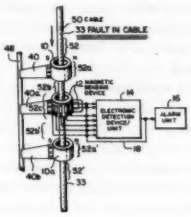
U.S. Cl. 324—206 **5 Claims**

1. Apparatus to detect a flaw in a moving cable that can be magnetized, comprising:

(a) first and second magnets each having a north pole and a

south pole spatially separated and adjacent said cable to magnetize the moving cable;

(b) a magnetic sensing device adjacent said cable located between said magnets independent of and not coupled to either of said magnets wherein the moving cable in either direction after being magnetized by one of said magnets is passed through the magnetic sensing area of said magnetic



sensing device, said magnetic sensing device sensing any change in the magnetic field of the magnetized cable, said change in the magnetic field resulting from any flow in said magnetized cable; and

(c) means to convert the output of the magnetic sensing device to useable form so that the flaw of the magnetic cable becomes known.

4,538,108

TESTING ARRANGEMENT FOR FERROMAGNETIC BODIES INCLUDING MAGNETIC FIELD DETECTORS EXTENDING BETWEEN TWO PAIRS OF POLES OF MAGNETIC FIELD GENERATORS SPACED LONGITUDINALLY ALONG THE BODY

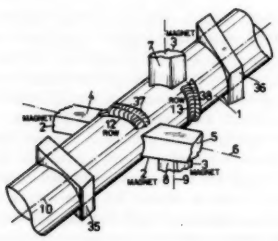
Gerhard Hüschelrath, Laufach-Frohnhofen, and Wilfried Lein, Hanau, both of Fed. Rep. of Germany, assignors to NUKEM GmbH, Hanau, Fed. Rep. of Germany

Filed Aug. 16, 1982, Ser. No. 408,686

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1981, 3132808

Int. Cl.³ G01N *27/82*; G01R *33/06*

U.S. Cl. 324—232 **17 Claims**



1. An apparatus for non-destructively testing for structural irregularities in a ferromagnetic body having a longitudinal extent comprising:

first magnetic pole means, including at least two magnetic poles, for generating a first stationary magnetic field having a first central linear axis passing through said two magnetic poles and radially through said body;

second magnetic pole means, including at least two magnetic poles spaced apart along said body from said first magnetic pole means, for generating a second stationary magnetic field having a second central linear axis passing through said two magnetic poles and radially through said ferromagnetic body, said first and second central axes being inclined with respect to one another at an angle α which is substantially equal to 180°/N, where N is the total number of magnetic fields generated by said apparatus;

means for longitudinally displacing said body with respect to the poles of said first and second magnetic pole means;

a plurality of rows of stationary Hall generators, each row extending either in a space between the magnetic poles of the first magnetic pole means or between the magnetic poles of the second magnetic pole means, for detecting a magnetic field over a zone corresponding to a section of said body perpendicular to the displacing direction of said body, said Hall generators providing detector signals indicative of the fields sensed thereby;

means for time multiplexing said detector signals to form a time multiplexed signal;

a pulse sequence control circuit for driving said Hall generators and to which said time multiplexed signal can be synchronized;

means for generating compensation values for various signal levels of said Hall generators as a function of the position of the Hall generator whose output is being compensated;

a compensation amplifier for compensating said time multiplexed signal with said compensation values; and

means for analyzing said compensated time multiplexed signal.

4,538,109

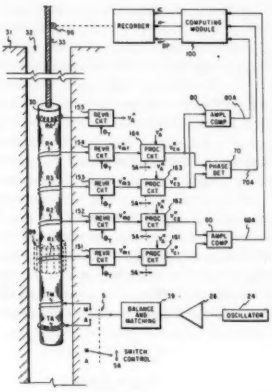
APPARATUS AND METHOD FOR ELECTROMAGNETIC LOGGING WITH REDUCTION OF SPURIOUS MODES

Brian Clark, Ridgefield, Conn., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Jun. 23, 1982, Ser. No. 391,096

Int. Cl.³ G01V *3/30*

U.S. Cl. 324—338 **35 Claims**



1. A method for borehole logging, comprising the steps of:

transmitting electromagnetic energy from a transmitter location in the borehole;

receiving transmitted energy at a receiver location in the borehole spaced from the transmitter location;

generating a receiver signal in response to the received energy;

detecting the transverse magnetic electromagnetic energy component of the transmitted energy in the region of the receiver location; and

correcting the receiver signal in accordance with the detected transverse magnetic component, so as to remove from said receiver signal the effect of said transverse magnetic component.

4,538,110

HIGH-STABILITY CLOCK SIGNAL REGENERATOR WITH A STABLE FIXED FREQUENCY BACKUP CLOCK GENERATOR

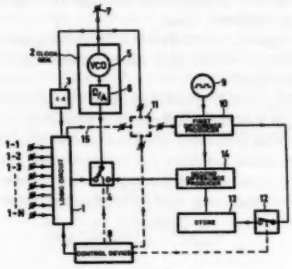
Leendert J. Hollaar, Zwolle; Herman Zoetman, and Robert J. M. Verbeek, both of Hilversum, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 29, 1983, Ser. No. 508,997

Claims priority, application Netherlands, Jul. 5, 1982, 8202685

Int. Cl.³ H03K *5/135, 5/26*

U.S. Cl. 328—63 **6 Claims**



1. A clock signal regenerator comprising a clock signal generator whose frequency is controlled by a control signal, said clock signal generator included in a control loop for synchronizing the frequency of the clock signal generated by the clock signal generator with an input signal applied to the control loop by means of a control signal derived from the frequency difference between the clock signal and the input signal, said regenerator comprising: an auxiliary signal generator for producing a fixed-frequency auxiliary signal, a first difference-signal producer connected to the auxiliary signal generator and connected to receive the generated clock signal to determine the frequency difference between the auxiliary signal and a signal which is proportional to the clock signal, a storage device connected to the first difference signal producer for storing the determined frequency difference, a second difference signal producer connected to the first difference signal producer and to the storage device to determine the difference between the frequency difference stored in the storage device and a signal produced by the first difference signal producer, which signal is proportional to the frequency difference between the auxiliary signal and the clock signal, and switching means for applying in the absence of a reliable input signal the signal produced by the second difference signal producer as a control signal to the controllable clock signal generator.

4,538,111

CIRCUIT RECOVERING THE CARRIER OF A SIGNAL AMPLITUDE AND PHASE MODULATED BY DIGITAL SIGNALS

Pietro P. Giusto, Turin, Italy, assignor to CSELT Centro Studi e Laboratori Telecomunicazioni SPA, Turin, Italy

Filed Sep. 24, 1982, Ser. No. 423,086

Claims priority, application Italy, Nov. 12, 1981, 68462 A/81

Int. Cl.³ H03D *3/00*

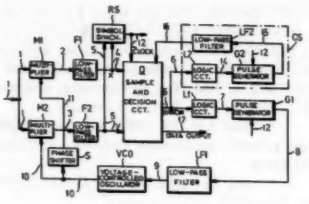
U.S. Cl. 329—122 **1 Claim**

1. An apparatus for recovery of a carrier of a signal herein referred to as recovered carrier, amplitude-modulated and phase modulated by digital signals referred to herein as modulating signal in a coherent demodulation system which reconstructs base-band components of said modulating signal, said base-band components of said modulating signal being apt to be represented by modulus and sign on a Cartesian plane (signal plane), and forming a geometric representation of said received signal, characterized in that a phase-error estimate of said recovered carrier is effected by making a comparison between position of said received signal in a signal plane and a plurality of decision thresholds duly positioned in said signal plane; said comparison being effected at a decision instant usually used to estimate transmitted digital symbols; said decision thresholds subdividing the signal plane into three classes of regions, a first class comprising points where said received signal can be found when there is a positive-sign phase error in said recovered carrier, a second class comprising points where said received signal can be found when there is a negative-sign phase-error in said recovered carrier, a third class comprising points where said received signal can be found when no phase error exists in said recovered carrier; said first and second classes comprising a pre-determined number of regions in relation with the magnitude of said phase error of said recovered carrier; the inclusion in one of said classes and regions being univocally denoted by a digital symbol which is utilized to generate a control signal for a local oscillator which comprises:

a first and a second multiplier, each receiving as one input the modulated signal, the outputs of the multipliers being in phase quadratures;

a pair of low-pass filters respectively connected to said outputs of multipliers;

a sample and decision circuit receiving outputs from said filters having controllable thresholds for comparing at a selected instant, amplitudes of baseband components from said filters and producing an output;



a first logic circuit coupled to said sample and decision circuit for estimating positioning errors of said thresholds with respect to an ideal position on the basis of the digital symbol output by said sample and decision circuit, a first pulse generator connected to and controlled by said first logic circuit, and another low-pass filter connected between said first pulse generator and said sample and decision circuit for applying said adjustment signal thereto;

a second logic circuit connected to said output of said sample and decision circuit for receiving a digital symbol output by said sample and decision circuit and representing the phase error of the received carrier;

a second pulse generator connected and controlled by said second logic circuit for generating a correction pulse;

a further low-pass filter connected to said second pulse generator and filtering a sequence of correction pulses received therefrom;

a voltage-controlled oscillator having as an output said recovered carrier which is applied as first multiplier signal to said second multiplier;

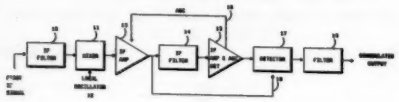
a phase shifter connected between said output of said voltage-controlled oscillator and said first multiplier for feeding a second multiplier signal to said first multiplier which is in a phase quadrature with said first multiplier signal; and

a symbol synchronism-recovery circuit for triggering said sample and decision circuit at said instant.

4,538,112
DETECTOR USING DELAYED AND UNDELAYED INPUTS FOR DEMODULATING FM OR PM SIGNALS

Richard M. Lena, Tewksbury, Mass., assignor to Wang Laboratories, Inc., Lowell, Mass.

Filed Aug. 30, 1982, Ser. No. 412,626
Int. Cl.³ H03D 3/06
U.S. Cl. 329—145 2 Claims



1. A demodulator for demodulating a frequency or phase modulated carrier signal to obtain a demodulated signal comprising

at least one intermediate frequency (IF) filter for delaying a modulated carrier signal for subsequent mixing with the undelayed modulated carrier signal,

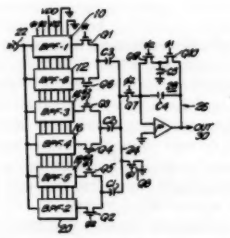
amplifying means for amplifying the output of said IF filter including automatic gain control for controlling the gain of said amplifying means, and

mixing means for mixing said modulated carrier signal with said delayed modulated carrier signal whereby a demodulated signal is obtained.

4,538,113
SWITCHED CAPACITOR FILTER

Charles A. Lish, Coram, N.Y., assignor to Standard Microsystems Corporation, Hauppauge, N.Y.

Filed Apr. 6, 1984, Ser. No. 597,264
Int. Cl.³ H03F 3/68
U.S. Cl. 330—126 6 Claims

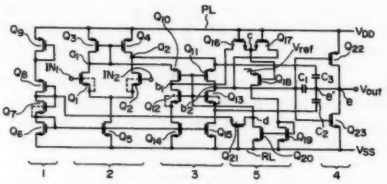


1. A band-pass filter comprising an input terminal, a plurality of filter sections having predetermined transform functions and each having an input operatively connected to said input terminal, an output terminal, each of said plurality of filter sections comprising a switched capacitor filter including a plurality of switched capacitors, the values of the capacitances of said switched capacitances being selected so that each of said filter sections contributes one pair of conjugate poles to the overall filter transform function, and means operatively interposed between the outputs of said plurality of filter sections and said output terminal for selectively weighting and summing the outputs of said filter sections such that the active poles contributed by each of said filter sections are arranged on a circle concentric with and having a radius less than that of a unit circle of the z plane, said poles, with the exception of corrector poles, being equiangularly spaced from one another along said pole circle.

4,538,114
DIFFERENTIAL AMPLIFIER

Nobuo Kunimi, Sayama; Koichi Shimizu, Yokohama, and Toshiro Suzuki, Tama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 1, 1983, Ser. No. 528,656
Claims priority, application Japan, Sep. 3, 1982, 57-152731
Int. Cl.³ H03F 3/45
U.S. Cl. 330—253 9 Claims



1. A differential amplifier comprising:

a pair of differential input field-effect transistors with channels of a first conductivity type;

a current-mirror load circuit which is comprised of first and second field-effect transistors with channesl of a second conductivity type connected between the drains of said pair of differential input field-effect transistors and a first power terminal;

a third field-effect transistor with a channel of the second conductivity type receiving at its source a signal from the junction between the drain of said first field-effect transistor of said current-mirror load circuit and the drain of one of said pair of differential input field-effect transistors;

a fourth field-effect transistor with a channel of the second conductivity type receiving at its source a signal from the junction between the drain of said second field-effect transistor of said current-mirror load circuit and the drain of the other of said pair of differential input field-effect transistors;

a load circuit which forms a current path between the drains of said third and fourth field-effect transistors and a second power terminal;

a voltage generation circuit which generates a bias voltage applied to the gates of said third and fourth field-effect transistors, and

feed back means coupled between the drains of said third and fourth field-effect transistors and the gates of said third and fourth field-effect transistors, said feedback means including means for controlling the voltage level of the gate bias on said gates of said third and fourth field-effect transistors in accordance with the voltage level at said drains of said third and fourth field-effect transistors.

4,538,115
JFET DIFFERENTIAL AMPLIFIER STAGE WITH METHOD FOR CONTROLLING INPUT CURRENT

James R. Butler, San Jose, Calif., assignor to Precision Monolithics, Inc., Santa Clara, Calif.

Filed Jun. 15, 1984, Ser. No. 621,053
Int. Cl.³ H03F 3/16, 3/45
U.S. Cl. 330—253 7 Claims

1. A JFET (junction field effect transistor) differential amplifier stage, comprising:

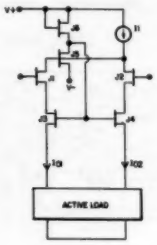
first and second JFETs connected in a differential amplifier stage with their sources connected together, and their gates adapted to receive respective input voltage signals,

a current source connected to supply current to the JFETs, the magnitude of current supplied by said current source being great enough to establish gate-source voltages for the two JFETs which are less than their pinchoff voltages (V_p),

a third JFET cascoded with the first JFET and with its gate connected in circuit with the source of the first JFET,

a fourth JFET cascoded with the second JFET and with its gate connected in circuit with the source of the second JFET,

said third and fourth JFETs each developing a voltage at least as great as the differential between the gate-source



voltage and V_p for their respective first and second JFETs, whereby the gate-drain voltages of the first and second JFETs are maintained at at least V_p to keep them in a saturated mode with a high ouput impedance, and

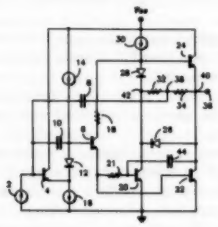
fifth and sixth JFETs connected to buffer the first and second JFETs from capacitances at the gates of the third and fourth JFETs.

4,538,116

OUTPUT STAGE FOR AN OPERATIONAL AMPLIFIER

Robert L. Vyne, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 19, 1984, Ser. No. 590,948
Int. Cl.[3] H03F *3/30*
U.S. Cl. 330—271 **5 Claims**



1. An operational amplifier for providing load current to an output terminal, comprising:

an input stage;

an output stage including first, second and third NPN output transistors, each having base, emitter and collector terminals, said first NPN output transistor having an emitter coupled to said output terminal for conducting load current thereto and a collector terminal for coupling to a first source of supply voltage, said second NPN output transistor having a collector coupled to said output terminal for sinking load current therefrom and an emitter for coupling to a second source of supply voltage, and said third NPN output transistor having a collector coupled to said output terminal and an emitter for coupling to said second source of supply voltage;

at least a first emitter follower transistor having a base terminal coupled to the output of said input stage, a collector coupled to the base of said first NPN output transistor and an emitter coupled to the base of said third NPN output transistor;

a first capacitor coupled between the output of said input stage and said output terminal;

a resistor coupled between the emitter of said emitter follower transistor and the base of said second NPN output transistor; and

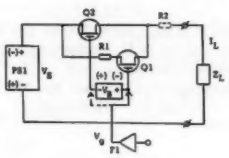
a second capacitor coupled between the base of said second NPN output transistor and said output terminal, said first and second capacitors for stabilizing said amplifier.

4,538,117

TRANSISTOR AMPLIFIER

Bengt G. Olsson, Galärvägen 13, Saltsjö-Boo, Sweden (S-132 00)

PCT No. PCT/SE82/00272, § 371 Date Apr. 6, 1983, § 102(e) Date Apr. 6, 1983, PCT Pub. No. WO83/00965, PCT Pub. Date Mar. 17, 1983
PCT Filed Aug. 27, 1982, Ser. No. 483,955
Claims priority, application Sweden, Aug. 28, 1981, 8105111
Int. Cl.[3] H03F *3/16*
U.S. Cl. 330—277 **3 Claims**



1. An amplifier for connection as a two-pole device between a DC power source and a load impedance comprising:

(a) first and second MOS-transistors of the same conductivity type, each having source, drain and gate terminals, the source terminals being commonly connected and forming one pole of said two-pole device, said one pole being connectable to said load impedance;

(b) resistance means connected between the drains of the first and second MOS-transistors, said resistance means having substantially the same magnitude as said load impedance, said resistance means having a first end connected to the drain of said first MOS-transistor means and a second end connected to the drain of the second MOS-transistor to form the other pole of said two-pole device, said other pole being connectable to said DC power source;

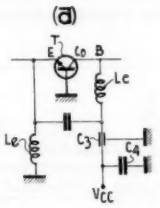
(c) DC voltage generating means connected between the respective gates of said first and second MOS-transistors for applying a substantially constant voltage therebetween, the polarity of said constant voltage causing said second MOS-transistor to conduct less than said first MOS-transistor, the magnitude of said constant voltage precluding said second MOS-transistor from conducting until said first MOS-transistor conducts at the full rated current thereof; and

(d) drive means connected in the gate circuits of said first and second MOS-transistors for applying a control voltage, causing said transistors to conduct.

4,538,118
TRANSISTOR AMPLIFIER OPERATING AT ULTRA HIGH FREQUENCY UNDER PULSE OPERATING CONDITIONS

Roland Lorieux, Paris, France, assignor to Thomson CSF, Paris, France

PCT No. PCT/FR82/00083, § 371 Date Aug. 27, 1982, § 102(e) Date Aug. 27, 1982, PCT Pub. No. WO82/04166, PCT Pub. Date Nov. 25, 1982
PCT Filed May 18, 1982, Ser. No. 414,372
Claims priority, application France, May 22, 1981, 81 10255
Int. Cl.³ H03F 3/60
U.S. Cl. 330—286 **6 Claims**

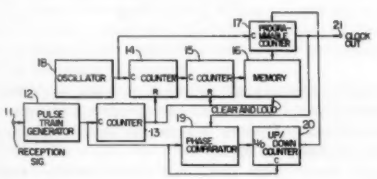


1. A transistor microwave amplifier operating under pulse operating conditions comprises:
- at least one transistor connected with base to ground and receiving input pulses;
- an input inductance placed in parallel across the base and connected to the emitter of said at least one transistor;
- a collector inductance connected to the collector of said at least one transistor;
- a voltage supply source applying a current to the collector of said at least one transistor through said collector inductance;
- a capacitor connected in parallel across said source;
- a decoupling capacitor connected between said source and said collector inductance;
- a capacitor connected between the emitter and the collector of said at least one transistor, supplied by said source and intended to store the energy during the test periods of said at least one transistor and to restore it at the beginning of each input pulse, said capacitor connected between said emiter and collector of said at least one transistor having a short time constant in order to reduce the effects of the input and collector inductances.

4,538,119
CLOCK EXTRACTION CIRCUIT USING AN OSCILLATOR AND PHASE-LOCKED PROGRAMMABLE DIVIDER

Akira Ashida, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 15, 1982, Ser. No. 368,665
Claims priority, application Japan, Apr. 17, 1981, 56-56949
Int. Cl.³ H03L 7/06
U.S. Cl. 331—1 A **5 Claims**

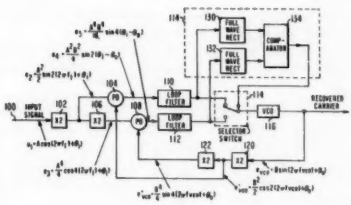


1. A phase-locked circuit capable of following a varying frequency input signal comprising:
- an oscillator for generating a clock signal having a frequency higher than the frequency of the input signal;
- a pulse train generator receiving the input signal for providing a timing signal indicating a certain phase in the input signal and forming a pulse train having pulses appearing corresponding to the timing signal;
- average period count/storage means for measuring an average period of the input signal by counting the number of pulses of said clock signal during an interval of a predetermined number of input periods obtained by counting pulses of the pulse train and storing the count;
- a programmable counter for dividing the frequency of said clock signal in accordance with the stored count and providing an output signal; and
- phase comparison/correction means for comparing the phase of said output signal with the phase of pulses in said pulse train, and producing a phase correction signal as a result of said comparison; whereby said programmable counter increases or decreases said stored count in accordance with said phase correction signal to modify the phase of said output signal.

4,538,120
CARRIER RECOVERY LOOP FOR RECEPTION OF QUADRAPHASE SHIFT KEYED SIGNALS

Thaddeus A. Hawkes, Haddonfield, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 19, 1983, Ser. No. 562,525
Int. Cl.³ H03L 7/00
U.S. Cl. 331—12 **7 Claims**



1. A carrier recovery loop for the reception of quadraphase shift keyed (QPSK) signals e_1 of frequency f_1 and comprising:
- first and second frequency multiplying means for successively multiplying f_1 by two to produce a signal e_2 of frequency $2f_1$ and then again by two to produce a signal e_3 of frequency $4f_1$ with the phase modulation thereby removed;
- a voltage controlled oscillator (VCO) for producing an output signal e_{vco} of variable frequency f_{vco};
- third and fourth frequency multipling means for successively multiplying f_{vco} by two to produce a signal e'_{vco} of frequency $2f_{vco}$ and then again by two to produce a signal e''_{vco} of frequency $4f_{vco}$;
- first and second phase detector means responsive respectively to e_2 and e'_{vco} and to e_3 and e''_{vco} to produce first and second output signals;
- means for filtering out high frequency components from the output signals of said first and second phase detectors;
- said phase detectors each having a characteristic operating curve wherein the output of the phase detector varies substantially sinusoidally with linear variation of the phase difference of the two signals supplied thereto and where the negative-going cross-over transitions of said sinusoidal operating characteristic curves are unstable; and
- means responsive to the output signals of said means for filtering to generate a control signal indicating when the output of said second phase detector is nearing an unstable negative-going cross-over transition; and
- switching means responsive to said control signal to connect

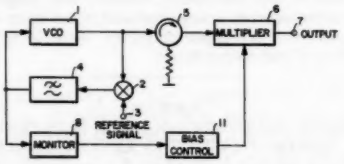
the output signal of said first phase detector to the input of said VCO when the output of said second phase detector is near an unstable negative-going cross-over transition.

4,538,121

HIGH FREQUENCY GENERATOR WITH OUTPUT SHUT-OFF OR REDUCED BY BIASING MULTIPLIER DIODE

Yasuhiro Yano, Inagi; Isamu Umino, Kawasaki; Zenichi Ohsawa, Yokohama, and Takayuki Ozaki, Tochigi, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 27, 1982, Ser. No. 452,922
Claims priority, application Japan, Dec. 29, 1981, 56-212127
Int. Cl.³ H03L *7/06;* H03B *1/00*
U.S. Cl. 331—25 **8 Claims**



1. A high frequency generator comprising:

generating means for generating a high frequency signal, said generating means comprising a phase-locked loop, including:

a voltage controlled oscillator generating a first output signal and having an input terminal;

a reference signal generator, operatively connected to said voltage controlled oscillator, for providing a reference signal;

mixing means having an output terminal, operatively connected to said voltage controlled oscillator and said reference signal generator, for mixing the first output signal and the reference signal, and outputting a signal in accordance with a phase-difference between the first output signal and the reference signal; and

a loop-filter, operatively connected to said output terminal of said mixing means and said input terminal of said voltage controlled oscillator, for supplying a control signal to said voltage controlled oscillator, wherein said voltage controlled oscillator generates the first output signal in dependence upon the control signal supplied from said loop-filter;

multiplier means, operatively connected to said generating means, for receiving and multiplying the high frequency signal and outputting harmonic frequency signals, said multiplier means including:

an input terminal, operatively connected to said generating means, for receiving the high frequency signal;

a multiplier diode, operatively connected to said input terminal, for providing harmonic frequency signals of the high frequency signal; and

means, operatively connected to said multiplier diode, for supplying a bias voltage to said multiplier diode, so that the harmonic frequency signals of said multiplier means are controlled in accordance with the bias voltage supplied to said multiplier diode;

bias controlling means, operatively connected to said multiplier means, for controlling the bias voltage supplied to said multiplier diode;

output means, operatively connected to receive the harmonic frequency signals from said multiplier means, for outputting a fixed harmonic signal of the harmonic frequency signals; and

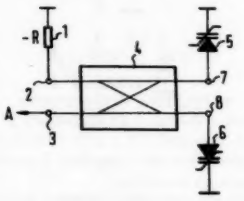
a monitoring circuit, operatively connected to said output terminal of said mixing means, for monitoring the synchronization between the reference signal and the first output signal from said voltage controlled oscillator, and for providing an alarm signal to said bias controlling means when the synchronization is not detected by said monitoring circuit.

4,538,122

DIODE OSCILLATOR WITH INDEPENDENTLY VARIABLE FREQUENCY AND POWER

Laszlo Szabo, Korntal, and Klaus Schünemann, Braunschweig, both of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Aug. 16, 1983, Ser. No. 523,546
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1982, 3230830
Int. Cl.³ H03B *7/12;* H03L *5/02;* H03C *3/20*
U.S. Cl. 331—96 **16 Claims**



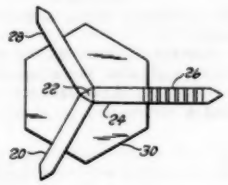
1. An oscillator for electromagnetic waves, comprising a two-terminal device (1) as an active element and an impedance-matching network (4) for matching the two-terminal device to a load (A), characterized in that the impedance-matching network is formed by a coupler (4) having four terminals (2, 3, 7, 8), that a respective first and second of the terminals (7, 8) are terminated with variable impedances (5, 6) for independently adjusting or continuously varying the output power and the frequency, respectively, that a third one of the terminals (2) is connected to the active two-terminal device (1), and that a fourth terminal (3) is the oscillator output.

4,538,123

DIELECTRIC WAVEGUIDE BANDPASS APPARATUS

Elio A. Mariani, Hamilton Square; Richard A. Stern, Allenwood, and Richard W. Babbitt, Fair Haven, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 20, 1984, Ser. No. 572,350
Int. Cl.³ H01P *1/20, 3/16, 1/213*
U.S. Cl. 333—208 **6 Claims**



1. Dielectric waveguide bandpass apparatus comprising:

a dielectric waveguide input having one end for receiving a broadband millimeter wavelength signal including the desired bandpass signal;

a right ferrite prism positioned to receive the broadband signal from the other end of said dielectric waveguide input;

a dielectric waveguide bandstop filter element having one end positioned to receive the broadband signal from said

right ferrite prism, said dielectric waveguide bandstop filter element having a series of periodically spaced transverse slots cut in its upper surface to reflect a narrow band of frequencies including said desired bandpass signal of said broadband signal back to said right ferrite prism and pass the remaining frequencies of said broadband signal through said dielectric waveguide bandstop filter element to the other end thereof;

a load connected to the other end of said dielectric waveguide bandstop filter element; and

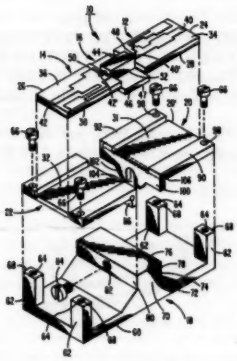
a dielectric waveguide output having one end positioned to receive said reflected narrow band of frequencies from said right ferrite prism and the other end for transmitting said narrow band of frequencies.

4,538,124

PLANAR MICROWAVE CIRCUIT COMPONENT MOUNTING SYSTEM

Melvin M. Morrison, Paterson, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Feb. 10, 1984, Ser. No. 579,186
Int. Cl.³ H01P *1/00*
U.S. Cl. 333—246 **10 Claims**



1. In a planar microwave circuit system including at least one subsystem, said subsystem including a thermally conductive heat sink base;

an electrically conductive circuit support structure adapted to be secured to said base;

a dielectric substrate secured to the support structure, said substrate having first and second plane surfaces, one of said surfaces including at least one conductor lying in a first plane and being adapted to receive a lead of a circuit component connected thereon, the other surface including a ground plane conductor which is ohmically connected to said support structure, said lead being spaced a given distance from a mounting surface of the component, the improvement comprising:

at least one thermally and electrically conductive component receiving surface on said base to which said component mounting surface can be secured, said receiving surface lying in a second plane spaced from the first plane of said one conductor; and

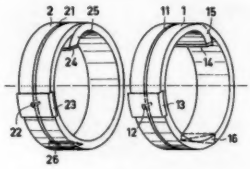
means coupled to said support structure and said base for setting the distance between said first plane and said component receiving surface to substantially the value of said given distance.

4,538,125

DEVICE FOR MICROWAVE TRANSMISSION BETWEEN TWO BODIES WHICH ARE ROTATABLE RELATIVE TO EACH OTHER

Friedrich K. Beckmann, Schenefeld; Wolfgang Hoppe, Norderstedt, and Wolfgang Meyer, Henstedt-Ulzburg, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 21, 1983, Ser. No. 487,406
Claims priority, application Fed. Rep. of Germany, Apr. 24, 1982, 3215377
Int. Cl.³ H01P *1/00*
U.S. Cl. 333—248 **6 Claims**



1. A microwave slip ring comprising:

a first waveguide arranged at least partly around an axis, said first waveguide having first and second ends and a coupling slot therein extending around the axis between the first and second ends;

a first fixed aerial arranged in the first waveguide at the first end thereof;

a first attenuator in the first waveguide, said attenuator and the first end of the first waveguide defining an active sector therebetween, said active sector having an end at the aerial and an end at the attenuator, microwave energy propagated in the active sector of the first waveguide interacting with the first fixed aerial;

a first moveable aerial rotatable around the axis, said first moveable aerial projecting into the coupling slot and into the active sector of the first waveguide, said moveable aerial projecting into the active sector over an angular range approximately equal to 180°;

a second waveguide arranged at least partly around the axis and axially spaced from the first waveguide, said second waveguide having first and second ends and a coupling slot therein extending around the axis between the first and second ends;

a second fixed aerial arranged in the second waveguide at the first end thereof;

a second attenuator in the second waveguide, said second attenuator and the first end of the second waveguide defining an active sector therebetween, said active sector having an end at the aerial and an end at the attenuator, microwave energy propagated in the active sector of the second waveguide interacting with the second fixed aerial;

a second moveable aerial coupled to the first moveable aerial so as to be rotatable around the axis therewith, said second moveable aerial projecting into the coupling slot and into the active sector of the second waveguide, said second moveable aerial projecting into the active sector of the second waveguide over an angular range approximately equal to **180°** ;

characterized in that the first and second waveguides and the first and second moveable aerials are arranged so that:

the first moveable aerial rotates out of the active sector of the first waveguide near the aerial end of the active sector of the first waveguide when the second moveable aerial rotates into the active sector of the second waveguide near the aerial end of the active sector of the second waveguide; and

the second moveable aerial rotates out of the active sector of the second waveguide near the attenuator end of the

active sector of the second waveguide when the first moveable aerial rotates into the active sector of the first waveguide near the attenuator end of the active sector of the first waveguide.

4,538,126

ELECTROMAGNETIC RELAY WITH SYMMETRIC REACTION

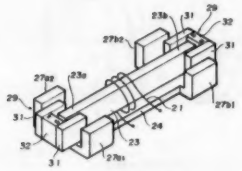
Yoshihide Bando, Kyoto, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Apr. 30, 1984, Ser. No. 605,655

Claims priority, application Japan, Apr. 24, 1983, 58-64888[U]

Int. Cl.³ H01H *50/04*

U.S. Cl. 335—78 **5 Claims**



1. An electromagnetic relay, comprising:
(a) a core made of magnetic material;
(b) an electromagnetic coil wound around said core so that the two ends of said core project therefrom and constitute core end poles;
(c) a yoke extending generally parallel to said core, each end of the said yoke being formed with two poles pieces which extend towards the corresponding end pole of said core so as to lie one on each side thereof with a certain gap being defined therebetween;
(d) a connecting member extending generally parallel to said core and said yoke and mounted so as to be movable transversely to its longitudinal axis;
(e) means for establishing and breaking electrical connection according to movement of said connecting member transversely to its longitudinal axis; and
(f) two armature pieces, one for each end of said core, both fixed to said connecting member, and each comprising a permanent magnet plate and two plates of magnetic material fixed to said permanent magnet plate so as generally to form a C shape with one of said magnetic material plates being magnetized to be a north pole and the other being magnetized to be a south pole, each of the two plates of magnetic material being inserted on one side of said end of said core between the side of said end of said core and the opposing one of said pole pieces of said yoke into said gap therebetween;
(g) the directions of magnetization of said armature pieces being oppositely oriented.

4,538,127

MAGNETIC QUADRIPOLE

Denis F. Spicer, Bedford, England, assignor to Texas Instruments Incorporated, Dallas, Tex.

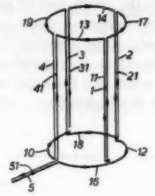
Continuation of Ser. No. 948,845, Oct. 5, 1978, abandoned. This application May 14, 1981, Ser. No. 263,611

Claims priority, application United Kingdom, Oct. 31, 1977, 45237

Int. Cl.³ H01F *7/00*

U.S. Cl. 335—210 **2 Claims**

1. A cylindrical coil structure comprising a single continuous conductive path having first and second portions each disposed in a meander around the axis of symmetry of said cylindrical coil structure and including equispaced longitudinal conductor sections parallel to said axis of symmetry joined by bridge conductor sections extending transversely of said axis of symmetry at ends of said cylindrical coil structure, wherein said meanders of the first and second portions extend in antiphase to each other such that longitudinal conductor sections of the first and second portions overly each other in pairs and corresponding bridge conductor sections of the first and second portions together define substantially closed peripheries at opposite ends of said longitudinal conductor sections to form a series of pseudo-loops each comprising spaced



first and second pairs of longitudinal conductor sections, each of the first and second pairs including a longitudinal conductor section of each meander, and a pair of bridge conductor sections one of each meander for constraining current flow along said continuous conductive path in one direction along the longitudinal conductor sections of the second pair, and in opposite directions through adjacent bridge conductor sections of the first and second portions.

4,538,128

DEVIATOR FOR AN AUTO CONVERGENT COLOR PICTURE TUBE AND ITS METHOD OF MANUFACTURE

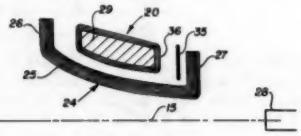
Jean-Pierre Fourché , Marsaunay la Cote, and Marc Milili, Dijon, both of France, assignors to Videocolor, Montrouge, France

Filed Sep. 30, 1983, Ser. No. 538,053

Claims priority, application France, Oct. 5, 1982, 82 16680

Int. Cl.³ H01F *7/00*

U.S. Cl. 335—210 **5 Claims**

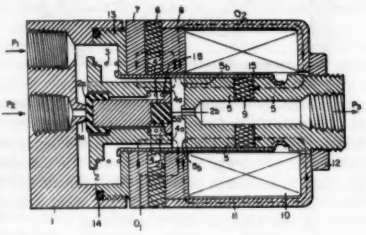


1. In autoconvergent color image tubes having differently sized tube screens, an interchangeable deviator assembly for use in any of the tubes, the assembly comprising:
a saddle-shaped horizontal deviation coil having front and rear napes being generally perpendicular to the axis of the tube;
a vertical deviation coil positioned in radially outward concentric relation to the horizontal deviation coil; and
a magnetic screen positioned generally perpendicular to the tube axis, between the rear nape of the horizontal deviation coil and a confronting surface of the vertical deviation coil for
(a) deviating magnetic lines of force from the vertical deviation coil, in the vicinity of the magnetic screen, forwardly toward the tube screen;
(b) deviating magnetic lines of force from the horizontal deviation coil, in the vicinity of the magnetic screen, rearwardly away from the tube screen;
the inclusion of the magnetic screen resulting in a displacement of the horizontal and vertical deviation centers to effect accurate vertical and horizontal deviation for the tubes having differently sized tube screens without necessitating modifications to the horizontal or vertical deviation coils.

4,538,129
MAGNETIC FLUX-SHIFTING ACTUATOR

Richard T. Fisher, 149 Barker St., Pembroke, Mass. 92359

Continuation of Ser. No. 264,365, May 18, 1981, Pat. No. 4,403,765, which is a continuation of Ser. No. 97,079, Nov. 25, 1979, abandoned. This application Jul. 1, 1982, Ser. No. 394,475
The portion of the term of this patent subsequent to Sep. 13, 2000, has been disclaimed.
Int. Cl.³ H01F *3/12*; F16K *31/08*
U.S. Cl. 335—230 **7 Claims**



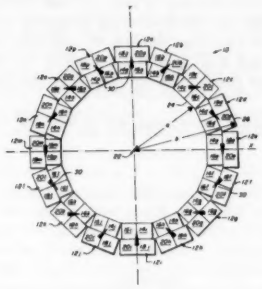
1. In a magnetic flux-shifting actuator the combination of:
(a) a fixed armature substantially of soft iron;
(b) a plunger movable relative to said armature to outwardly move and retract a connection to an external load;
(c) said plunger having a first position in which a gap is formed between said plunger and said armature and said plunger having a second position in which said gap between said plunger and said armature is closed;
(d) means for forcing said plunger away from said armature to establish said gap;
(e) a housing for an electromagnet surrounding said armature and having a wall of soft iron;
(f) a first fixed permanent magnet having a relatively high coercive force so that the polarization thereof is normally unalterable;
(g) a second fixed permanent magnet having a relatively low coercive force so that the polarization thereof is normally alterable, said second magnet being displaced relative to said first magnet in a direction longitudinally of said armature;
(h) a first soft iron member engaging one side of said first magnet;
(i) a second soft iron member engaging the other side of said first magnet;
(j) said first soft iron member, said plunger, said second soft iron member and said first magnet forming a first flux path;
(k) a portion of said armature, said second soft iron member, said wall of said housing for an electromagnet, and said second magnet forming a second flux path; and
(l) an electromagnet in said housing adapted to be energized in opposite directions to change the polarity of said second magnet thereby causing attraction of said plunger by said armature.

4,538,130
TUNABLE SEGMENTED RING MAGNET AND METHOD OF MANUFACTURE

Robert L. Gluckstern, College Park, Md.; Ronald F. Holsinger, Carlisle, and Robert R. Lown, Billerica, both of Mass., assignors to Field Effects, Inc., Acton, Mass.

Filed Apr. 23, 1984, Ser. No. 602,761
Int. Cl.³ H01F *7/02*
U.S. Cl. 335—306 **24 Claims**

1. A tunable segmented ring magnet extending along a magnet axis perpendicular to the plane of the ring configuration thereof, and defining a torus surrounding an interior space, said magnet producing a preselected magnetic field within said interior space transverse to said magnet axis, said magnet comprising
A. a first plurality of inner magnet segments, each of said inner magnet segments being formed of a permanant magnetic material having essentially linear behavior in the second quadrant of the B-H curve and having an easy axis of magnetization in a predetermined orientation,

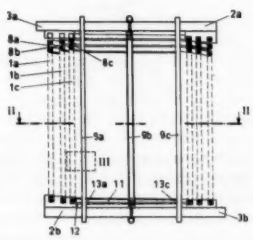


B. a second plurality of outer magnet segments located radially outward from said inner magnet segments, each of said outer magnet segments being formed of a permanant magnetic material having essentially linear behavior in the second quadrant of the B-H curve and having an easy axis of magnetization in a predetermined orientation, and
C. tuning means for moving at least one said magnet segment radially relative to said ring to produce a preselected transverse magnetic field in said interior space.

4,538,131
AIR-CORE CHOKE COIL

Manfred Baier, Oberehrendingen, and Andreas Rascher, Küttigen, both of Switzerland, assignors to BBC Brown, Boveri & Company, Ltd., Switzerland

Filed Nov. 30, 1983, Ser. No. 556,645
Claims priority, application Switzerland, Jan. 27, 1983, 442/83
Int. Cl.³ H01F *27/08*
U.S. Cl. 336—57 **14 Claims**



1. An axially symmetric air-core choke coil, comprising:
at least one winding, said at least one winding having a plurality of helically wound, spaced apart, wire cable turns, said coil having an inner cylindrical periphery inside said coil and an outer periphery concentrically surrounding said inner periphery;
a plurality of axially extending, electrically non-conductive, strips, spaced circumferentially around said at least one winding, each strip including a plurality of folded sections, respective ones of said folded sections being fitted between respective adjacent turns, a plurality of air gaps being defined between said turns and said strips, said strips

being arranged to permit radial and longitudinal air flow through said air gaps;

means for generating an axial air flow along said inner cylindrical periphery of said coil, said axial air flow being adapted to reduce the air pressure at said inner periphery to induce outside air to flow through said air gaps; said means for producing an axial air flow comprises a screen, said screen being adapted to block air flow through the center of one axial end of said coil and to define an axial gap between the circumferential periphery of said screen and said at least one winding of said coil, whereby air entering said axial gap is accelerated to produce said reduced air pressure along said inner periphery of said coil; and

means for axially prestressing said at least one winding.

4,538,132

IMPEDANCE CONVERTING TRANSFORMER FORMED OF CONDUCTORS EXTENDING THROUGH A MAGNETIC HOUSING

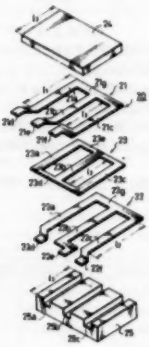
Torao Hiyama, Haramachi, and Kazuo Nishizawa, Koide, both of Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Sep. 24, 1982, Ser. No. 423,240

Claims priority, application Japan, Oct. 6, 1981, 56-148313[U]

Int. Cl.³ H01H *85/46*

U.S. Cl. 336—221 **4 Claims**



1. A transformer for converting an input signal to an output signal of different impedance comprising first and second conductors each being formed unitarily to have at least three overlap portions each having respective terminals at one end and an integral connection portion connecting the other ends of each of said overlap portions together; means including a member formed of insulating material and interposed between said first and second conductors electrically isolating said overlap portions of said first conductor from said overlap portions of said second conductor; and two discrete housing members each formed as a block of a magnetic substance and forming respective cores, at least one of said cores having three grooves; said overlap portions being placed in said grooves of said one core; said two cores being bonded to each other with said overlap portions between them to couple said overlap portions together electromagnetically, wherein said first and second conductors are arranged such that said connecting portions thereof do not superpose with each other.

4,538,133

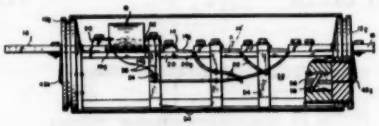
PASSIVELY DETONATED EXPLOSIVELY-ASSISTED FUSE

Herbert M. Pflanz, Westwood, Mass., assignor to Phoenix Electric Corporation, Boston, Mass.

Filed Dec. 19, 1983, Ser. No. 562,827

Int. Cl.³ H01H *85/00, 37/76*

U.S. Cl. 337—4 **13 Claims**



1. In an explosively-assisted fuse having a main current conductor, explosive charge proximate to said conductor for severing said conductor when said charge is detonated, a detonator responsive to a voltage applied thereto for detonating said charge, and a main fuse in parallel with said main conductor for receiving current from said conductor when said conductor is severed, the improvement comprising

an auxiliary fuse in series with said main conductor and providing a voltage across opposite ends thereof on melting in response to fault currents therethrough, and

means connecting said detonator across said auxiliary fuse for receiving a detonating voltage therefrom.

4,538,134

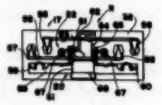
CONTROL APPARATUS

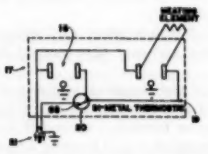
John C. Carey, Box 1143, Glasgow, Mont. 59230

Continuation-in-part of Ser. No. 366,042, Apr. 29, 1982, abandoned. This application Mar. 30, 1984, Ser. No. 595,549

Int. Cl.³ H01H *37/04*

U.S. Cl. 337—113 **15 Claims**





1. Temperature responsive control apparatus including a housing portion, a socket portion, a circuit portion, a temperature responsive portion, a connecting portion and a fastening portion; said housing portion including an enclosure member including a major face section and a plurality of sidewall sections extending from edges thereof, a cover section joining free edges of said sidewall sections and forming a chamber with said enclosure member, said enclosure member including divider sections extending from said major face section and said sidewall sections toward said cover section; said socket portion including a plurality of openings in said enclosure member; said openings being arranged into groups of at least two adjacent openings with each group providing a combination of openings mateable with an electrical plug member; said circuit portion including at least two spaced buss bar members, said

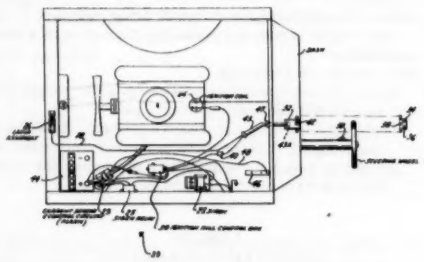
buss bar members being disposed within said chamber of said enclosure member in a generally parallel relationship, each of said buss bar members including a contact section adjacent each end thereof extending in one direction therefrom toward said socket openings and terminating adjacent thereto, one of said contact sections that extends from one of said buss bar members being disposed adjacent a socket opening of each socket opening group and one of said contact sections that extends from another buss bar member being disposed adjacent a second socket opening of each socket openings group; said temperature responsive portion including bi-metal thermostat means, said bi-metal thermostat means being disposed within said chamber and having one contact thereof connected to one of said buss bar members; said connecting portion including positive and neutral contact terminals, a contact terminal extending from one of said buss bar members, and another of said contact terminals extending from a second contact of said bi-metal thermostat means; said contact terminals being arranged closely adjacent to each other, each of said contact terminals extending through said cover section; said fastening portion including fasteners securing said cover section to said enclosure member; whereby electrical current only moves through said control apparatus to energize electrical devices having plug members inserted into said socket portion when a threshold temperature of said bi-metal thermostat means is passed.

4,538,135

VEHICULAR SECURITY SYSTEM

Earl W. Turner, Brockton, Mass., assignor to Audiovox Corp., Hauppauge, N.Y.

Filed Jul. 9, 1982, Ser. No. 396,716
Int. Cl.³ B60R *25/00*; E05B *65/19*
U.S. Cl. 340—63 **14 Claims**



1. The security system for a vehicle having an engine compartment with an engine and ignition contained therein, a hood covering for the engine compartment, and an ignition switch for operation of the ignition and the engine, the system comprising:

a. a hood latch;

b. ignition disabling means;

c. lock means for operating said hood latch;

d. switch means for releasing said disabling means to permit operation of the ignition, said disabling means being in circuit with said ignition switch to reinstitute a disabling of said ignition upon the turning off of said ignition switch;

e. a tamper resistant housing enclosing said lock means and said switch means to permit operation of said lock means and said switch means; and wherein

f. said housing comprises a front wall, a back wall, a bottom wall, a top wall configured as a cover of said housing, and sidewalls joining the front wall and the back wall and extending from said bottom wall to said top wall, a lock of said lock means being disposed in said front wall, and a switch of said switch means being disposed in said front wall alongside said lock of said lock means;

g. said lock means comprising a cable interconnecting said lock with said hood latch, said cable being coupled to said lock at a location within said housing, said security system further comprising a tube extending through said back wall of said housing and entering into said engine compartment, said tube being positioned for receiving said cable within said housing to provide a secure passage for said cable from said housing and into said engine compartment;

h. said disabling means including a lock-up circuit responsive to the joint occurrence of an electric current from said ignition switch and from said switch means, said switch means including an electrical conductor passing through said housing and through said tube and into said engine compartment for connecting the switch of said switch means with said lock-up circuit, said tube providing secure passaage for said electrical conductor from said housing to said engine compartment;

i. said housing including a guide disposed within the housing, a front end of said tube being rotatably secured within said housing by said guide, the front end of said tube having a flange for engagement with said guide to prevent extraction of said tube from said housing while permitting rotation of said tube relative to said housing to facilitate installation of said housing and said tube within said vehicle;

j. said lock means including a slide extending inwardly from said front wall to permit displacement of said lock in a direction along an axis of said cable, thereby to impart longitudinal motion to said cable for locking and locking said hood latch, said guide extending between said bottom wall and said cover with a bottom portion of said guide connecting with said bottom wall and a top portion of said guide connecting with said cover to permit assembly of said tube to said housing, and a portion of said slide being located on said cover to permit assembly of said lock to said housing; and wherein

k. said disabling means includes a relay having a contact connected in parallel connection with breaker apparatus of said ignition for bypassing the breaker apparatus, said relay being driven by said lockup circuit, said lockup circuit having a first input terminal and a second input terminal, means in circuit with said ignition switch for applying a voltage representing a logic level to said first terminal, means in circuit with said switch of said switch means for applying a variable voltage as a logic level to said second input terminal, said variable voltage means including a resistor-capacitor circuit allowing the voltage level to drop during a discharge of said capacitor with a predetermined time constant, a set of interconnected logic gate elements connecting with said first and said second input terminals and providing an output signal for operation of said relay; and a diode interconnecting an output terminal of one of said logic gates with said variable voltage level at said second input terminal to provide a lockup function for retaining said relay in a state of energization during closure of said ignition switch, and subsequent to a momentary closure of said switch of said switch means.

4,538,136

POWER LINE COMMUNICATION SYSTEM UTILIZING A LOCAL OSCILLATOR

Richard B. Drabing, Los Altos, Calif., assignor to Amtel Systems Corporation, Sunnyvale, Calif.

Filed Mar. 30, 1981, Ser. No. 248,728
Int. Cl.³ H04B *3/54*; H03D *3/00*; H03C *3/00*
U.S. Cl. 340—310 R **2 Claims**

1. In a communication system, a transmitter for generating a narrow band RF frequency shift keyed signal on a powerline including a first and a second frequency in each of a plurality of channels corresponding to a first and a second logical data bit from a source of data, respectively, comprising:

an oscillator having an output;

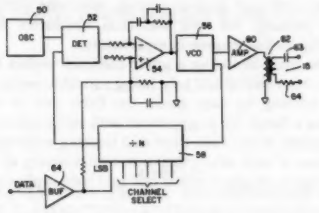
a phase detector having a first input coupled to said output of said oscillator, a second input and an output;

an operational amplifier having a first input coupled to said output of said detector, a second input and an output;

a first RC network coupled between said first input and said output of said amplifier;

a voltage controlled oscillator (VCO) having an input coupled to said output of said amplifier and an output;

a multi-channel select circuit having an input coupled to said output of said VCO, an output coupled to said second input of said detector and a data input for providing a plurality of channels;



a second RC network coupled to said second input of said amplifier;

first means for providing each of said data bits to said data input of said multi-channel select circuit; and

second means for providing each of said data bits to said second input of said amplifier and said second RC network for controlling the magnitude and speed of change in the frequency of the output of said VCO in response to said first and said second data bits whereby said output of said VCO undergoes smooth transitions between said first and said second frequencies in each of said channels.

4,538,137

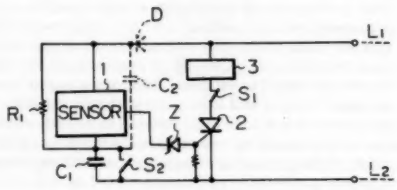
FIRE DETECTOR

Tetsuo Kimura, Tokyo, Japan, assignor to Nittan Company, Limited, Tokyo, Japan

Filed Jan. 20, 1983, Ser. No. 444,475

Int. Cl.³ G08B *29/00, 17/06*

U.S. Cl. 340—512 **9 Claims**



1. A fire detector designed for connection between a pair of electrical alarm lines, comprising:

a sensor producing an output voltage which corresponds to a magnitude of a condition of interest, such as smoke concentration, air temperature and the like;

a charge reservoir connected between said pair of alarm lines and being charged by current flowing through them; and

a switching circuit connected to the sensor and the charge reservoir and turning on and off to respectively discharge and charge the charge reservoir, the switching circuit turning on as a function of said output voltage and voltage across the charge reservoir, whereby the charge reservoir is repeatedly charged and discharged with a period determined by said output voltage.

4,538,138

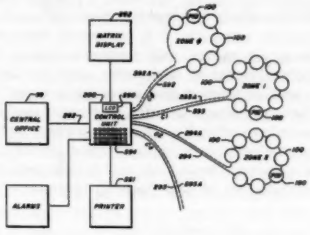
INTEGRATED SECURITY SYSTEM HAVING A MULTIPROGRAMMED CONTROLLER

Roy L. Harvey, Milton; Kevin J. Griffin, Waltham; Aaron A. Galvin, Lexington, and Louis H. Auerbach, Brighton, all of Mass., assignors to American District Telegraph Company, New York, N.Y.

Filed Dec. 17, 1982, Ser. No. 451,744

Int. Cl.³ G08B *19/00, 26/00*

U.S. Cl. 340—521 **27 Claims**



1. A security system comprising:

a control unit;

a plurality of cables, each connected to the control unit and each having a respective address;

a plurality of point interface devices each having a respective address, and at least one point interface device being connected to each of said cables;

each of the point interface devices being operative to provide a signal in response to and representative of a sensed condition;

said control unit including:

means for simultaneously addressing point interface device on different cables;

means for simultaneously receiving signals from the addressed point interface devices on different cables; and

processing means for sequentially processing the signals received from the point interface devices.

4,538,139

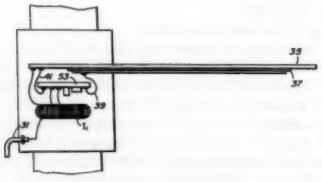
SIGNALLING APPARATUS

Anthony R. Clemente, Malden, Mass., assignor to Bolt Beranek and Newman Inc., Cambridge, Mass.

Filed Apr. 30, 1982, Ser. No. 373,524

Int. Cl.³ G08B *1/08*

U.S. Cl. 340—539 **6 Claims**



1. Apparatus for signalling remotely a sensed change in a local condition; said apparatus comprising:

a base;

a flat metal spring cantilevered from said base;

bonded to a face of said spring, a piezoelectric film of polyvinylfluoride;

means response to the sensed change in condition for snap-

ping the free end of said spring causing the spring to oscillate at its resonant frequency, thereby causing said film to generate a pulsating voltage;

means for rectifying and partially filtering said pulsating voltage thereby to provide a supply voltage having substantial ripple content at a frequency which is twice the characteristic resonant frequency of said spring frequency;

a crystal frequency controlled r.f. transmitter interconnected with said film and powered by said supply voltage to radiate an r.f. signal modulated at a signalling frequency which is essentially twice the characteristic resonant frequency of said spring;

a receiver for detecting and demodulating said radiated r.f. signal;

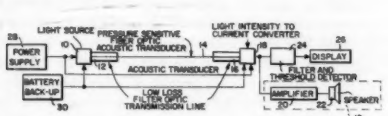
frequency selective means responsive to the demodulated signal for detecting and responding to a detected frequency component within the demodulated signal at essentially twice the resonant frequency of said spring and for generating an output signal in response thereto.

4,538,140

FIBER OPTIC ACOUSTIC TRANSDUCER INTRUSION DETECTION SYSTEM

David J. Prestel, Chagrin Falls, Ohio, assignor to Gould Inc., Rolling Meadows, Ill.

Filed Mar. 31, 1982, Ser. No. 363,854
Int. Cl.³ G08B *13/00*
U.S. Cl. 340—556 **10 Claims**



1. An intrusion detection system for sensing mechanical and acoustical vibrations in a room having walls, comprising:

a light source for generating a light beam at a point remote from the room;

first means, operatively connected to said light source, for transmitting the light beam to the room;

second means, coupled to said first means and positioned inside the walls of the room, for modulating the intensity of the light beam in response to mechanical or acoustical vibrations;

third means, coupled to said second means, for conducting the modulated light beam to a position remote from the room;

fourth means, operatively connected to said third means, for converting the modulated light beam to a detection signal;

fifth means, operatively connected to said fourth means, for generating an intrusion display signal in dependence upon the detection signal; and

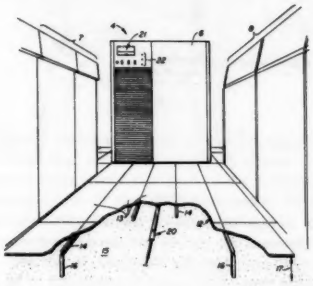
sixth means, operatively connected to said fourth means, for generating an audio signal in dependence upon the detection signal, the audio signal being a substantial reproduction of the mechanical or acoustical vibrations at all audio frequencies of the mechanical or acoustical vibrations which cause said second means to modulate the intensity of the light beam.

4,538,141

WATER DETECTION SUBASSEMBLY AND METHOD OF FORMING SAME, FOR COMPUTER PROCESSING CENTERS

Richard B. Feldman, Redwood City, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Oct. 4, 1982, Ser. No. 432,846
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—604 **4 Claims**



1. Method of forming a series of water detection subassemblies in association with a water detection system for use in a digital computing center, said center including a computing room have a raised floor above a sub-floor supporting computing equipment and the like comprising:

(i) pre-drilling a section of conventional plastic pipe with a series of transverse openings, said openings have axes of symmetry coextensive with each other and intersecting the central axis of symmetry of the pipe at about 90 degrees;

(ii) slicing the plastic pipe longitudinally along a central plane to bisect both the pipe and said series of openings transverse to the central axis of symmetry, whereby at least a pair of shields per longitudinal cut of the pipe is formed;

(iii) attaching said shields to said sub-floor in a predetermined deployment pattern;

(iv) stringing lengthwise through each of said shields a fabric mesh formed of an electrically non-conducting material to physically support a pair of conductors;

(v) disconnectably connecting said conductors to a voltage source means in circuit with an alarm of said detection system whereby said alarm is normally inactive, but if water contacts said conductors adjacent said sub-floor the alarm is activated to warn operators of said water invasion, but wherein said mesh and conductors are completely protected against physical abuse as from contact with workmen's shoes and the like during repair, replacement or renovation of said computing equipment.

4,538,142

SIGNAL SEAT FOR CHILDREN

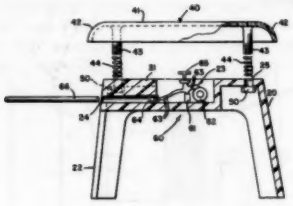
Scott B. Hamilton, 3733 S. County Rd. #5, Fort Collins, Colo. 80525, and Douglas B. Golden, 7843 SW. Ruby Ter., Portland, Oreg. 97219

Filed Sep. 30, 1982, Ser. No. 430,204
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—667 **7 Claims**

1. A signal seat for use in the disciplinary technique known as "time-out"; wherein the signal seat comprises, a stool member provided with: a normally closed first switch projecting above its surface; a recess adapted to receive a battery and a signal device; and an elongated aperture that is in open communication with the recess and the exterior of the stool member;

a seat member moveably mounted to said stool member, and having a surface adapted to engage said first switch to open the switch;

a battery and signal device operatively connected by electrical leads to said first switch device, whereby the signal device will be activated when the electrical circuit is completed;



a second switch operatively connected to the electrical circuit between the battery and the signal device to selectively open and close the electrical circuit; and

an elongated removable dowel dimensioned to be received within said elongated aperture, and having a length sufficient to engage said second switch while still projecting a substantial distance beyond said stool member.

4,538,143

LIGHT-EMITTING DIODE DISPLAYER

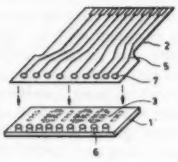
Tsukasa Ito, Tokyo, Japan, assignor to Clarion Co., Ltd., Japan

Filed Jun. 21, 1982, Ser. No. 390,186

Claims priority, application Japan, Jun. 24, 1981, 56-92414[U]

Int. Cl.³ G09G *3/14*

U.S. Cl. 340—719 **2 Claims**



1. A light-emitting diode displayer which comprises:

an LED substrate having opposite major surfaces on a first surface of which a plurality of LED chips are provided;

a film-like substrate having opposing major surfaces and adhered on the opposite surface of said LED substrate;

said LED substrate having conductive paths on said first surface electrically connected to said LED chips and having holes formed therein communicating between said major faces and intersecting portions of said paths, said film-like substrate having a conductive pattern of paths formed on one major surface thereof and holes so formed therein aligned with said holes of said LED substrate and intersecting portions of said conductive pattern, each aligned pair of said holes being filled with conductive paste self-curing to a hardened form to electrically connect the conductive paths of said substrates to each other.

4,538,144

GRAPHIC DISPLAY DEVICE HAVING GRAPHIC GENERATOR FOR SHADING GRAPHS

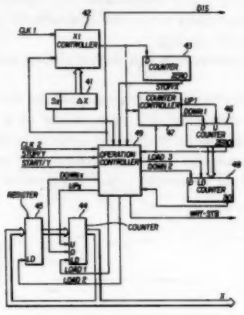
Nobuhiko Yamagami, Fuchu, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 18, 1982, Ser. No. 340,387

Claims priority, application Japan, Jan. 16, 1981, 56-4662

Int. Cl.³ G09G *1/16*

U.S. Cl. 340—747 **8 Claims**



1. A graphic display device for shading the region between the lines L_1 and L_2, comprising:

a straight line coordinates generating means for generating plural coordinates in order from a point P_1 to a point P_2 defining a line L_1 which connects said two points P_1 and P_2;

X or Y coordinates generating means electrically connected to said straight line generating means for counting X or Y coordinates from a point P_i on said line L_1 given by said straight line coordinates generating means in a predetermined direction and for generating the X or Y coordinates of lattice points of said graphic display device to provide shading in order to define shading lines parallel to the X or Y axis of said graphic display device;

control means, electrically connected to said straight line generator means and said X or Y coordinates generating means, for signalling said straight line coordinates generating means when the X or Y coordinates generating means completes the generation of the coordinates for a selected shading line;

a display generating means, electrically connected to said straight line coordinates generating means and said X or Y coordinates generating means, for shading a region between said line L_1 and said line L_2 in accordance with said coordinates of said lattice points designated to provide shading as designated by said straight line coordinates generating means and said X or Y coordinates generating means for said shading lines;

further comprising:

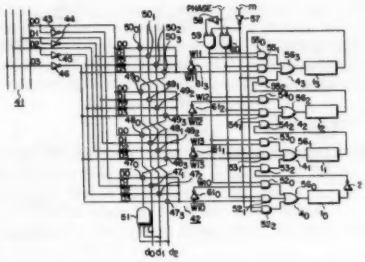
a detecting means, electrically connected to said straight line coordinates generating means and said X or Y coordinates generating means, for detecting intersections of said line L_1 and said line L_2 in accordance with the number of said lattice points designated to provide shading on a selected shading line; and

a changing means, electrically connected to said detecting means and said X or Y coordinates generating means, for changing the counting direction of said X or Y coordinates generating means after said detecting means detects an intersection of the lines L_1 and L_2.

4,538,145
DATA TRANSFER CONTROL DEVICE

Ryo Mitani, Yokohama; Yoshiaki Moriya, and Atsushi Kobayashi, both of Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Oct. 12, 1982, Ser. No. 433,711
Claims priority, application Japan, Oct. 15, 1981, 56-164706
Int. Cl.³ G09G *1/00, 3/00*
U.S. Cl. 340—805 **3 Claims**



1. A data transfer control device having an input terminal for receiving constant-formatted data and an output terminal for connection to a display having common electrodes, said data transfer control device comprising:

a plurality of shift registers for storing data and providing output signals to said output terminal;

means for receiving a common electrode selecting signal;

selector means, coupled to said input terminal and said common electrode selecting signal means, for receiving said constant-formatted data at said input terminal, for changing the arrangement of said constant-formatted data in accordance with said common electrode selecting signal, said selector means comprising a plurality of outputs for outputting said data with changed arrangements to a plurality of multiplexers; and;

means for receiving a mode selection signal;

wherein each one of said plurality of multiplexers is coupled to said mode selection signal receiving means and to a different one of said selector means outputs, and is further coupled to an input of a different one of said plurality of shift registers, said plurality of multiplexers including means, responsive to said mode selection signals, for either supplying said constant-formatted display data from said selector means to said shift registers or shifting the stored data in said shift registers in a closed loop.

4,538,146
INTEGRATED CIRCUIT OUTPUT PINS USED FOR INPUT SIGNALS

Dennis E. Morris, Saratoga, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Sep. 17, 1982, Ser. No. 419,265
Int. Cl.³ G09G *3/00, 3/32*
U.S. Cl. 340—814 **4 Claims**

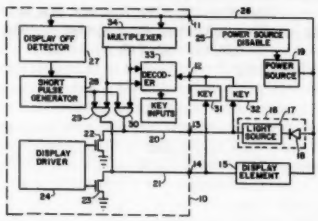
1. A circuit for permitting connections to an integrated circuit to be used to both drive display elements and provide strobe signal to a keyboard comprising:

a plurality of pins for coupling the integrated circuitt to the display elements and to the keyboard;

detection means coupled to all of said plurality of pins and responsive to signals appearing thereon for determining when the pins are not being used to supply signals to the display elements are in response thereto generating a first signal;

pulse generator means coupled to the detection means for generating pulses in response to the first signal;

a plurality of AND gates each having a first input terminal connected to receive the pulses from the pulse generator and each having an output terminal connected to a different one of the plurality of pins for supplying strobe signals thereto; and

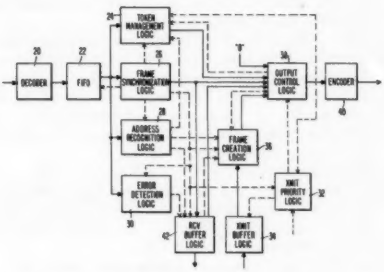


multiplexer means connected to receive signals from all of the pins and connected to supply signals to a different second input terminal of each of the AND gates for controlling which of the AND gates passes the strobe signal to one of the pins and the keyboard.

4,538,147
BANDWIDTH ALLOCATION IN A TOKEN CONTROLLED LOOP COMMUNICATIONS NETWORK

Robert M. Grow, Newtown, Conn., assignor to Burroughs Corp., Detroit, Mich.

Division of Ser. No. 388,122, Jun. 14, 1982, Pat. No. 4,459,588, which is a division of Ser. No. 355,021, Mar. 5, 1982, Pat. No. 4,404,557. This application Jun. 7, 1984, Ser. No. 618,335
The portion of the term of this patent subsequent to Apr. 24, 2001, has been disclaimed.
Int. Cl.³ H04Q *9/00;* **H04L** *11/00*
U.S. Cl. 340—825.05 **20 Claims**



1. A method of allocating bandwidth in a logical loop communications network, said network including a bus connected set of stations on a broadcast medium wherein a logical ordering of said stations is enforced by passing a write token from one of said stations to another in a predictable order with the last station in the order passing the write token to the first station in the order, each of said stations having associated with it at least one identifier address, said method comprising the steps of:

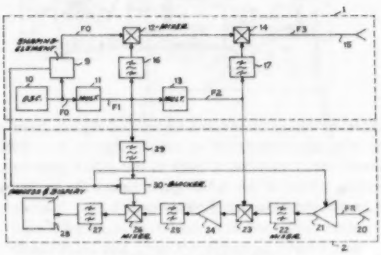
allocating to a number of said stations a portion of the bandwidth available on said logical loop; and

reserving for each one of said number of said stations that desires to reserve bandwidth for itself a portion of the allocated bandwidth, wherein the sum of the portions of the allocated bandwidth reserved by all of said number of said stations does not exceed the allocated bandwidth.

4,538,148
COHERENT RADAR

Christian Petitjean, and Maurice Marchand, both of Boulogne Billancourt, France, assignors to LMT Radio Professionnelle, Boulogne Billancourt, France

Filed Sep. 28, 1981, Ser. No. 306,342
Claims priority, application France, Oct. 3, 1980, 80 21225
Int. Cl.³ G01S 7/36, 13/34
U.S. Cl. 343—17.2 R **5 Claims**



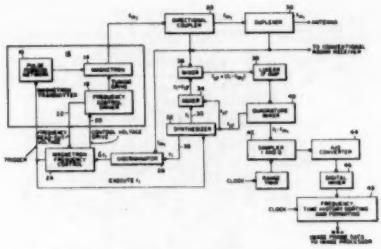
1. A coherent radar comprising:
a single master oscillator generating a master signal at a fixed frequency F0;
means, coupled to said master oscillator, for generating a first signal at a fixed frequency F1 and a second signal at a variable frequency F2, said first and second signals each being coherent with said master signal;
a first bandpass filter for filtering the first signal;
a second bandpass filter for filtering the second signal;
first means for mixing the first signal as filtered with said master signal to provide a first mixer signal coherent with said master signal;
second means for mixing the second signal as filtered with said first mixer signal to produce a transmission signal coherent with said master signal;
a transmission antenna for radiating the transmission signal;
a receiving antenna for receiving a reception signal having a frequency component FR;
a third bandpass filter for filtering the reception signal;
third means for mixing the reception signal filtered by the third filter with the second signal and providing a third mixer signal having a frequency component FR−F2;
an amplifier for amplifying the third mixer signal;
a fourth bandpass filter for filtering the third mixer signal amplified by the first preamplifier;
a fifth bandpass filter for filtering the first signal;
fourth means for mixing the third mixer signal filtered by the fourth filter with the first signal filtered by the fifth filter and for delivering a fourth mixer signal having a frequency component FR−F1−F2;
a sixth filter for filtering the fourth mixer signal; and
processing and display means for utilizing the fourth mixer signal to provide a radar indication.

4,538,149
FREQUENCY AGILE MAGNETRON IMAGING RADAR

Donald R. Wehner, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 18, 1982, Ser. No. 339,961
Int. Cl.³ G01S 7/42, 13/89
U.S. Cl. 343—17.2 R **11 Claims**

1. A signal generator comprising:
a magnetron transmitter including a magnetron and having a read-out voltage terminal, said magnetron transmitter including a pulse forming network operably coupled to said magnetrons said magnetron further including an adjustable member for varying the output frequency of said magnetron, said magnetron transmitter further comprising a magnetron control driver and having a driving voltage terminal, said adjustable member being operably coupled to said driving voltage terminal and being responsive to a change in the voltage on said driving voltage terminal to change the magnetron output frequency; and
control means operably coupled to said magnetron and to said pulse forming network for providing trigger signals

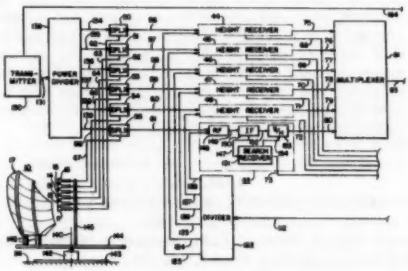


to said pulse forming network in response to the voltage signal on said read-out voltage terminal, said control means further providing a periodically reoccurring voltage input to said driving voltage terminal, said control means providing one of said trigger signals to said pulse forming network each time the voltage level on said read-out voltage terminal reaches a different one of the voltage levels of a set of predetermined voltage levels.

4,538,150
SELF-CALIBRATION OF STACKED BEAM RADAR

George D. Bone, Jr., Severna Park, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 10, 1983, Ser. No. 456,676
Int. Cl.³ G01S 7/40, 7/18
U.S. Cl. 343—17.7 **2 Claims**



1. A stacked beam radar system including a transmitter and multi-channel receiver having amplification over a predetermined input signal amplitude range, wherein amplified received radar target signals are compared to a stored amplified calibrated value to permit accurate measurement of relative target amplitude in each channel, which system comprises:
stacked beam transmitting means for transmitting a signal towards a target;
multi-channel receiver means for receiving target reflected signals including means for amplifying said target reflected signals;
means for generating a sequence of reference signals each having a predetermined amplitude;
means for coupling the sequence of reference signals to the input of respective channels of the receiver;

means for sensing calibrated output reference signals of the receiver fed from the input reference signals;

means for storing the calibrated output reference signals indicative of amplitude along with corresponding input reference signals to provide a table of receiver reference input signals and calibrated output reference signals over the dynamic range of the receiver;

means for looking up and comparing the amplified output received signals produced by an unknown amplitude target signal input to the receiver with stored calibrated output reference signals, and selecting the corresponding known reference signal which produced the calibrated output reference signal which most closely matches the amplified output received signals, and using said corresponding known reference signal as an indication of the amplitude of the unknown reflected receiver input signal.

4,538,151

ELECTRO-MAGNETIC WAVE ABSORBING MATERIAL

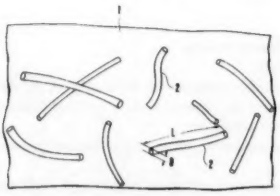
Kenichi Hatakeyama, and Tetsuji Inui, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Mar. 25, 1983, Ser. No. 478,914

Claims priority, application Japan, Mar. 31, 1982, 57-52610; Apr. 5, 1982, 57-56175

Int. Cl.³ G01S *7/36*; B22F *3/00*

U.S. Cl. 343—18 A **6 Claims**



1. Electro-magnetic wave absorbing material comprising a mixture more than 3% by weight of short fibers of metal or alloy having a high electric conductivity selected from the group consisting of Au, Ag, Cu, Ae, Zn, Ni, Fe and alloys thereof, a length of 0.1 mm to 50 mm and a length to diameter ratio of larger than 10, a ferromagnetic material selected from the group consisting of ferrite, iron, cobalt and nickel and a high molecular synthetic resin which further comprises carbon black and a ferrodielectric substance selected from the group consisting of barium titanate, lead titanate, strontium titanate, lead neobate, and lead zirconate.

2. An electro-magnetic wave absorbing body comprising a low input impedance layer formed on a electro-conductive member, and an impedance transforming layer formed on said low input impedance layer, said low input impedance layer comprising a mixture of short fibers of metal or alloy having a high electric conductivity, a length of from 0.1 mm to 50 mm and a length to diameter ratio of larger than 10, a ferromagnetic material and a high molecular synthetic resin.

4,538,152

SURVEILLANCE RADAR SYSTEM WHICH IS PROTECTED FROM ANTI-RADAR MISSILES

Wulf D. Wirth, Rheinbach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

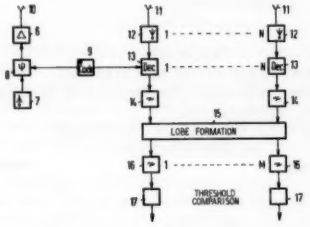
Filed Jan. 18, 1980, Ser. No. 113,175

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1979, 2902039

Int. Cl.³ G01S *13/00, 7/36*

U.S. Cl. 343—5 VQ **6 Claims**

1. A radar system comprising a radar transmitter located at a first geographic position and radiating coded omnidirectional signal on a substantially continuous basis, at least one radar receiver located at a second geographic location and including a directive antenna which is capable of being scanned and comprises a multiple lobe beam directional antenna with each lobe of the antenna being selectively connected to the receiver for continuously receiving radiant energy in each of said lobes, means for supplying the code of said transmitter to said receiver, each of said lobes of said directional antenna of said receiver comprising a resolution cell having a size determined by the single lobe width and said cell being at least large enough so that targets have a dwell time in said cell, said radar receiver antenna having a number of receiving elements with said elements determining said multiple lobe beams, a plurality of radio frequency amplifier and frequency conversion stages with one connected to each of said individual antenna elements to continuously receive a particular beam lobe and converting the incoming signal to a base band, a plurality of decoders with one of the decoders connected in each of said receiving lobe beam paths to compress the received signals for distance discrimination, a code member connected to said decoders to control them with the same code as utilized in said transmitter,



a plurality of first filters with a single filter connected to each of said plurality of decoders for filtering out permanent target echoes, a lobe formation network receiving the outputs of all of said plurality of first filters and supplying a plurality of outputs corresponding to the number of said receiving paths in said receiver, a plurality of second filtering means receiving the outputs of said lobe formation network and said second filtering means each comprising Doppler filters for coherent integration and further suppression of permanent signals in each lobe path through the receiver, and a plurality of integrators with at least one integrator connected in each receiving path for performing incoherent integration in each receiving path receiving the outputs of said second integrators so as to produce the output signals for each of said receiving paths of the receiver characterized in that the transmitter (1) is arranged at a specified distance from at least one receiver (3), and characterized in that the transmitter (1) has an antenna (10) with a constant omni-directional characteristic which may be a vertical dipole or a horizontal omni-directional antenna.

4,538,153

DIRECTIVITY DIVERSITY COMMUNICATION SYSTEM WITH MICROSTRIP ANTENNA

Tokio Taga, Yokohama, Japan, assignor to Nippon Telegraph & Telephone Public Corp., Tokyo, Japan

Filed Sep. 3, 1982, Ser. No. 414,804

Claims priority, application Japan, Sep. 7, 1981, 56-139827; Aug. 3, 1982, 57-134694

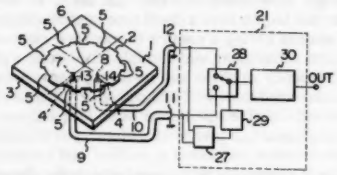
Int. Cl.³ H01Q *1/38*

U.S. Cl. 343—700 MS **5 Claims**

1. A directivity diversity communication system comprising:

(a) a micro-strip antenna having a dielectric layer sandwiched by a ground conductor plane and a circular radiation conductor plane, said circular radiation conductor plane having a plurality of slots provided around the entire circumference thereof, a pair of feed points provided on said radiation conductor plane, said feed points being positioned so that a line between a first feed point

and a center of the radiation conductor plane is substantially perpendicular to a line between a second feed point and a center of the radiation conductor plane, so that a radiation pattern by a first feed point is perpendicular to a radiation pattern by a second feed point,



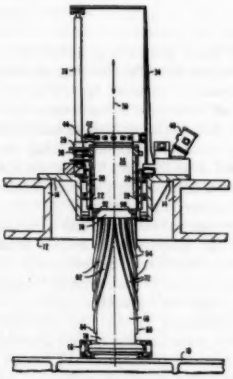
(b) a diversity receiver for receiving signals on a pair of input terminals, each of which is coupled with one of said feed points and each of the signals on an input terminal being combined with another on another input terminal through a diversity technique.

4,538,154

ANTENNA STOW MECHANISM

John H. Staehlin, Lutherville, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 21, 1983, Ser. No. 544,167
Int. Cl.³ H01Q 1/28
U.S. Cl. 343—705 **8 Claims**



1. An antenna assembly supported by a stationary housing having a surface, said antenna assembly including an antenna structure translationally movable along a first axis to render said antenna structure extended away from said stationary housing surface in a deployed state and retracted toward said stationary housing surface in a stowed state, when in said deployed state, said antenna structure operative to rotate through an angular azimuth path about said first axis, when in said stowed state, said antenna structure disposed in a predetermined azimuth orientation, said antenna assembly including:

a drive shaft having mechanically coupled to one end thereof said antenna structure and translationally movable along said first axis to permit extension and retraction of said antenna structure with respect to said stationary housing surface, said drive shaft having a plurality of integral cam grooves disposed around the periphery at the other end thereof and extending longitudinally along the surface of said drive shaft to said one end thereof; and

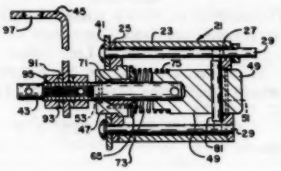
at least one cam follower bearing fixedly coupled to said stationary housing and disposed in a position to engage randomly one of said cam grooves of said plurality along the periphery at said other end of said drive shaft at the commencement of retraction of said antenna structure and to guide said drive shaft rotationally along the path of said engaged cam groove during said translational retraction movement of said antenna structure, said antenna structure being driven to said predetermined azimuth orientation by said cam guided drive shaft rotation during retraction thereof.

4,538,155

ANTENNA MOUNT WITH ROTARY POSITIONABLE FEATURE

William H. Stewart, 13610 Beech St., Milwaukie, Oreg. 97222

Filed Jun. 22, 1982, Ser. No. 390,987
Int. Cl.³ H01Q 1/32, 1/08
U.S. Cl. 343—715 **6 Claims**



1. In an antenna mount,

a mount body,

antenna mounting means for mounting an antenna whip on said body for movement from a vertical position to one or more other positions,

said antenna mounting means including an antenna mounting member,

said antenna mounting means including a shaft carrying said antenna mounting member and mounted by said antenna mounting means for turning movement about a predetermined axis to provide for movement of an antenna to the above recited positions,

said antenna mounting means also mounting said shaft for axial movement along said predetermined axis,

positive locking means for locking said antenna mounting member in positions corresponding to said above recited positions, and releasable upon axial movement of said shaft to permit turning movement of said shaft to change the position of the antenna mounting member,

friction clutch holding means independent of said locking means and being interposed between said shaft and said mounting member providing for forced turning movement of said antenna mounting member and thus the antenna whip relative to said shaft despite the shaft being held in a fixed position by said positive locking means.

4,538,156

INK JET PRINTER

David B. Durkee, Arlington Heights, and Alan J. Liebman, Skokie, both of Ill., assignors to AT&T Teletype Corporation, Skokie, Ill.

Filed May 23, 1983, Ser. No. 497,386
Int. Cl.³ G01D 15/16
U.S. Cl. 346—21 **1 Claim**

1. An ink jet page printer comprising:

a source of ink (201);

one or more print heads (7) each comprising a plurality of jets (55) and a corresponding plurality of actuators (62) responsive to electrical signals for selectively projecting droplets of ink;

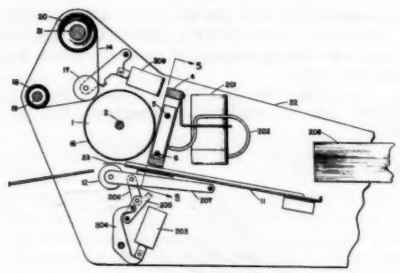
a transfer medium (1) having a moving surface (16) thereof adjacent to but spaced apart from said print head (7) for receiving said projected droplets;

circuitry (902) for generating said electrical signals for controlling said print heads to create patterns of droplets of ink on said moving surface (16) said circuitry comprising a memory (908) for storing indicia representative of patterns of droplets of ink to be projected on said moving surface (16), a means (906) for writing indicia into said memory in response to received input signals, a means (910) for reading indicia from said memory and means (913) for controlling said printing heads (7) in accordance with said indicia read from said memory;

an arrangement (12, 203 to 207) for selectively transferring the droplet patterns from said transfer medium surface (16) to a printing medium (23), said arrangement comprising a printing medium support surface (11) and a printing pressure roller assembly (12, 204 to 207) for pressing a printing medium (23) supported on said support surface into line contact with said transfer medium surface (16) when enabled, and means (203) for selectively enabling said printing pressure roller assembly;

a printing medium feed assembly (208) for storing a plurality of sheets of printing medium (23) and for moving said sheets one at a time to said printing medium support surface (11) in timed sequence with the operation of said printing pressure roller assembly (12, 204 or 207);

means (81, 921) coordinated with the movement of said moving surface for generating control signals for said



circuitry (902) said means coordinated with the movement of said transfer medium moving surface (16) comprising a timing track containing optically or magnetically discernible indicia (81) disposed on said surface (16) and means (921) for generating control signals in response to said discernible indicia;

lateral motion means (8, 9, 10, 51) for controlling moving said print heads (7) in a first direction transverse to the direction of travel of said transfer medium moving surface (16);

means (8) for controlling said lateral motion means to move said print heads (7) in coordination with the movement of said transfer medium such that each ink jet (55) successively serves the tracks of a plurality of adjacent parallel tracks on said transfer surface (16);

means for controlling said lateral motion means to move said print heads in a direction opposite to said first transverse direction so as to position said ink jet over the first track of its plurality of tracks; and

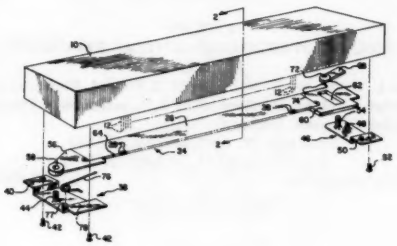
an arrangement (13) for cleaning said transfer medium (16) surface after the droplet patterns have transferred from said transfer medium surface to said printing medium (23), said arrangement (13) including a roller (17) for pressing a cleaning medium (14) into contact with the transfer medium surface (16) when enabled, and means (209) for selectively enabling said cleaning arrangement (13).

4,538,157

FLUID JET PRINTER AND METHOD OF OPERATION

David E. Jones, Richardson, Tex., assignor to The Mead Corporation, Dayton, Ohio

Filed Feb. 23, 1983, Ser. No. 468,439
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—75 **11 Claims**



1. A jet printer for printing on a print receiving medium, comprising:

print head means for generating a plurality of jet drop streams arranged in a row and directed at said print receiving medium, a plurality of fluid filaments emerging from said print head and breaking up into said jet drop streams,

drop charging means, including a notched charge electrode plate in which a plurality of charge electrodes are defined by electrically conductive coatings within notches spaced along one edge of said plate, said drop charging means permitting selective electrical charging of drops in each of the jet drop streams when electrical charging potentials are selectively applied to said charge electrodes and said charge electrodes partially surround corresponding fluid filaments,

drop control means for deflecting said drops in dependence upon the electrical charges carried thereby and for catching at least some of said drops,

mounting means for pivotally supporting said charging means such that said charge electrode plate may be pivoted between an operating position in which each charge electrode partially surrounds a corresponding one of said fluid filaments emerging from said print head, and a retracted position in which said charge electrodes are retracted from said fluid filaments, said mounting means providing for pivoting said charge electrode plate about an axis parallel to each of said streams and in line with said row of jet drop streams, and

means for pivoting said charge electrode plate into said operating position after start-up of said print head means and for pivoting said charge electrode plate into said retracted position prior to shutdown of said print head means, whereby contamination of said charging means by jet drops generated unstably at start-up and shutdown is prevented.

4,538,158

ELECTROSENSITIVE MEDIA AND RECORDING PROCESS

Bernard Warszawski, 122 avenue de Wagram, 75017 Paris, France

Filed Apr. 21, 1982, Ser. No. 370,475
Int. Cl.³ G01D *15/34*
U.S. Cl. 346—135.1 **31 Claims**

1. Electrochromic material comprising a homogeneous mixture having a solid consistency and consisting essentially of

(a) a hydrosoluble salt or a hydrosoluble mixture of salts of at least one metal cathodically depositable from an aqueous solution of its ions;

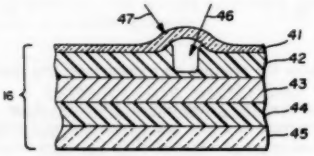
(b) an initially hydrosoluble film-forming polymer resin; and
(c) water;
the electrochromic material being able to develop by cathodic reduction of at least one depositable metal ion present within the electrochromic material metal marks, said metal marks electrocrystallizing as integral parts of the electrochromic material;
said electrochromic material being electroconductive.

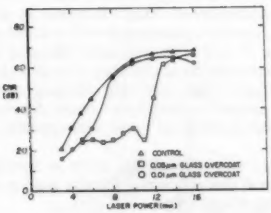
4,538,159

CERAMIC OVERCOATED OPTICAL RECORDING ELEMENT

Mool C. Gupta, W. Webster; Joseph J. Wrobel, Rochester, and Dennis G. Howe, Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 16, 1984, Ser. No. 600,643
Int. Cl.³ G01D *15/34*; G03C *1/76*
U.S. Cl. 346—135.1 **10 Claims**





1. A recording element comprising a support having thereon a heat-deformable optical recording layer having a transparent ceramic overcoat characterized in that the optical recording layer
(a) is an amorphous layer of a dye and a binder;
(b) has an absorption factor of at least 20 at a first wavelength and is substantially transparent at a second wavelength;
(c) is capable of being thermally deformed by a beam of high energy density radiation of the first wavelength to form a deformation comprising a hole or depression surrounded by a sharply defined ridge; and
(d) the overcoat has a thickness up to 0.05 μm.

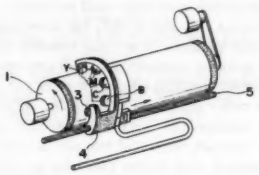
4,538,160

INK JET RECORDING APPARATUS

Tadamitsu Uchiyama, Yokohama, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jan. 12, 1983, Ser. No. 457,395
Claims priority, application Japan, Jan. 26, 1982, 57-10381
Int. Cl.³ G01D *15/18*; H04N *1/46*
U.S. Cl. 346—140 R **7 Claims**

1. An ink jet recording apparatus which comprises, in combination:
a plurality of first nozzles for respectively jetting different colored inks towards a recording medium being moved in a scanning direction, said first nozzles being adapted to receive image signals independently of each other while the first nozzles are moved in a sub-scanning direction relative to the recording medium thereby to record an image on the recording medium;
a second nozzle device provided separately of, and spaced a predetermined distance from, the first nozzles for jetting a processing liquid, containing a preselected processing material, onto the recording medium only in an area substantially corresponding to the area in which colored ink is jetted by said first nozzles; and



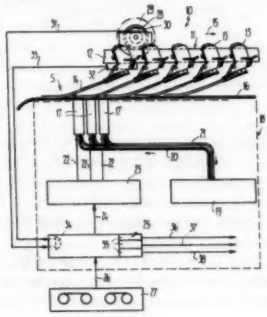
a control device for applying the image signals at different times to the respective first nozzles and to said second nozzle devices such that the colored inks and the processing liquid are respectively deposited on the recording medium in superimposed relation to each other, said control device being operable to produce a logical product of the image signals associated with the colored inks of different colors.

4,538,161

APPARATUS FOR ADDRESSING NEWSPAPERS, JOURNALS AND OTHER PRINTED PRODUCTS

Walter Reist, Hinwil, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed May 23, 1983, Ser. No. 497,141
Claims priority, application Switzerland, Jun. 1, 1982, 3348/82
Int. Cl.³ G01D *15/18*; B65H *25/04*
U.S. Cl. 346—140 R **4 Claims**



1. An apparatus for addressing newspapers, journals, periodicals and other printed products, comprising:
a stationary printer defining a printing station for applying an address to the printed products;
conveying means for guiding said printed products past said printer;
said conveying means and said printer having coordinated conveying and printing velocities;
said conveying means comprising an individual conveyor equipped with gripper units arranged in spaced relationship from each other and structured to each take-up one of said printed products;
control means associated with said individual conveyor and including means for generating a control pulse at the passage of each one of said gripper units;

said control means further including a monitor responsive to empty ones of said gripper units in order to suppress said control pulse; and

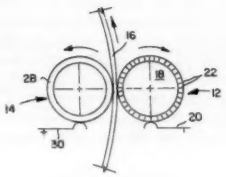
said control means initiating a printing operation by said printer each time an unsuppressed control pulse is generated.

4,538,162

METHOD AND APPARATUS FOR LINE-AT-A-TIME PRINTING

Steven C. Detweiler, 1624 The Alemeda #32, San Jose, Calif. 95126

Filed Jan. 21, 1983, Ser. No. 432,255
Int. Cl.³ G01D *15/06*
U.S. Cl. 346—155 **5 Claims**



3. Apparatus for signal transfer from a horizontal scan of stored information to a line of dots on a reproduction surface comprising,

(a) a printing drum having a cylinder-like exterior surface and an axis of rotation,

(b) a transferal drum having a cylinder-like exterior surface and an axis of rotation,

(c) said printing drum and said transferal drum being rotatable relative to each other about their axes with their axes parallel to each other,

(d) said printing drum comprising a plurality of individual disk-like wheels, the center of each wheel being at said axis of rotation of said printing drum, each wheel insulated from its neighbor, said disk-like wheels having radial spurs around the circumference thereof, the radial extremity of each spur being separated from its neighbor at the circumference of said wheel, all of said spurs of a wheel being conductively connected within that wheel, each wheel of said plurality being aligned so as to align spur extremities on adjacent wheels along said cylinder-like exterior surface into a row of spurs,

(e) separate means for energizing each of said wheels by contacting at least one radial extremity of said spurs on a wheel in response to said horizontal scan of said stored information,

(f) said reproduction surface being positioned between said printing drum and said transferal drum with a row of spurs having at least electrical contact with said reproduction surface,

(g) whereby a horizontal scan of said stored information energizes individual disk-like wheels in sequence horizontally along said printing drum by energizing said separate means in sequence at a spur of each wheel to energize a spur in said contact with said reproduction surface and aligned with said transferal drum thus producing a row of dots across said reproduction surface in accord with said horizontal scan,

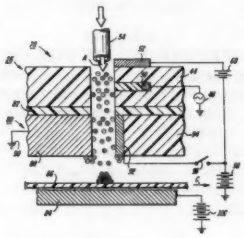
(h) and means for rotating said printing drum and said transferal drum and for advancing said reproduction surface in accord with vertical spaced sequence of said horizontal scans of said stored information to establish said line of dots on said reproduction surface.

4,538,163

FLUID JET ASSISTED ION PROJECTION AND PRINTING APPARATUS

Nicholas K. Sheridon, Saratoga, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 2, 1983, Ser. No. 471,380
Int. Cl.³ G01D *15/06*
U.S. Cl. 346—155 **18 Claims**



1. A fluid jet assisted electrographic marking apparatus for placing electrostatic charges upon a charge receptor in an imagewise pattern, said apparatus being characterized by including

means for supplying a transport fluid,

housing means defining a channel therethrough, said channel being elongated in a direction transverse to the direction of movement of the transport fluid, through which the transport fluid may be directed to the charge receptor, said housing including an ion generation portion and an ion modulation portion, each portion being adjacent to said channel, and wherein

said ion generation portion includes ion generating means located adjacent said channel and extending along the length of said channel for initiating a continuous series of RF arc discharges within said channel, for simultaneously creating a uniform supply of positive and negative ions along the length of said channel, directly in the transport fluid moving within said channel, and

said ion modulation portion includes modulation means located adjacent said channel comprising a plurality of spaced, conductive, modulating electrodes on one side of said channel, a conductive member on the side of said channel opposite to said modulating electrodes, a source of modulating potential, switch means for selectively connecting said source of modulating potential to each of said modulating electrodes, and a second source of reference potential connected to said conductive member, whereby each of said modulating electrodes controls the passage of a beam of ions from said channel when its respective switch is energized.

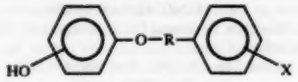
4,538,164

HEAT-SENSITIVE TRANSFER MEDIUM

Nobuhiro Takigawa; Hideo Watanabe; Kanzirou Kawasaki, all of Numazu; Keishi Kubo, Yokohama; Minoru Hakiri, and Eiichi Kawamura, both of Numazu, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Nov. 28, 1984, Ser. No. 675,911
Claims priority, application Japan, Nov. 30, 1983, 58-226470
Int. Cl.³ B41M *5/18*
U.S. Cl. 346—209 **6 Claims**

1. A heat-sensitive transfer medium comprising a transfer sheet having a transfer layer containing a leuco dye as the main component and a receiving sheet having a receiving layer containing a developer for said leuco dye as the main component, characterized in that said receiving layer contains porous filler having an oil absorption amount of at least 50 ml/100 g and a phenolic compound expressed by the general formula,



wherein R represents an alkylene group and X represents hydrogen or a halogen atom.

4,538,165

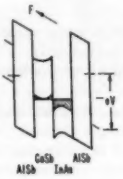
FET WITH HETEROJUNCTION INDUCED CHANNEL

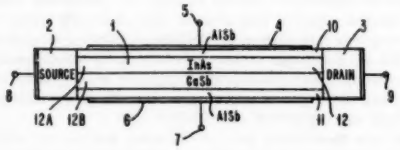
Chin-An Chang, Peekskill; Leroy L. Chang, Goldens Bridge; Leo Esaki, Chappaqua, and Emilio E. Mendez, Croton-on-Hudson, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 355,942, Mar. 8, 1982,. This application Mar. 5, 1984, Ser. No. 586,497

Int. Cl.[3] **H01L** *29/80, 29/205*

U.S. Cl. 357—22 **4 Claims**





1. In a field effect transistor of the type wherein current in a channel region is influenced by a voltage signal applied to a gate electrode over said channel, the improvement comprising a channel structure of contiguous undoped layers of semiconductor materials wherein an external material is provided between said gate electrode and said channel having a bandgap higher than that of the combined bandgaps of the semiconductor material layers of the conductive channel region and having the further requirement that the conduction band of a first layer of said channel is located below the top of the valence band of a second layer of said channel.

4,538,166

SEMICONDUCTOR MEMORY DEVICE

Motoo Nakano, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 220,967, Dec. 29, 1980, abandoned. This application Jan. 17, 1984, Ser. No. 571,639

Claims priority, application Japan, Dec. 29, 1979, 54-171195

Int. Cl.[3] **H01L** *29/78, 27/02, 29/04*

U.S. Cl. 357—23.6 **6 Claims**

1. A semiconductor memory device including a plurality of memory cells, each of which comprises a transistor and a capacitor, said memory device comprising:

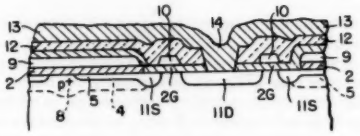
a semiconductor substrate of a first conductivity type;

an insulator layer formed on the surface of said semiconductor substrate;

a first semiconductor region of a second conductivity type, opposite said first conductivity type, formed in said semiconductor substrate beneath said insulator layer, said first semiconductor region functioning as one electrode of the capacitor of a memory cell;

a second semiconductor region of the first conductivity type having a first portion formed in said semiconductor substrate beneath said first semiconductor region, and having a second portion formed in said semiconductor substrate in a field area surrounding said first semiconductor region, each of said first and second portions having an impurity concentration higher than that of said semiconductor substrate, said first and second portions having different thicknesses;

a conductive layer formed on the portion of said insulator layer covering said first and second semiconductor regions and serving as the other electrode of the capacitor and as a field shield electrode, said conductive layer having a pattern identical to that of said second semiconductor region except at the portion where the capacitor is coupled to the transistor by said first semiconductor region; and



a gate conductor formed on said insulator layer and spaced apart from said conductive layer, said gate conductor functioning as a gate of the transistor of the memory cell;

said first semiconductor region having first and second portions, the first portion of said second semiconductor region being located beneath the first portion of said first semiconductor region, the second portion of said first semiconductor region being located under an area between said conductive layer and said gate conductor so as to connect the first portion of said first semiconductor region to the transistor, the second portion of said first semiconductor region having a depth greater than that of the first portion of said first semiconductor region.

4,538,167

SHORTED JUNCTION TYPE PROGRAMMABLE READ ONLY MEMORY SEMICONDUCTOR DEVICES

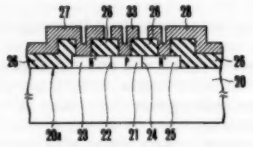
Hideo Yoshino; Eisuke Arai, and Kazuhide Kiuchi, all of Tokyo, Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Japan

Filed Sep. 8, 1981, Ser. No. 300,345

Claims priority, application Japan, Sep. 24, 1980, 55-133260; Nov. 20, 1980, 55-162565

Int. Cl.[3] **H01L** *29/04, 29/90, 27/10;* **G11C** *17/00*

U.S. Cl. 357—59 **2 Claims**



2. A shorted junction type programmable read only memory device having at least one element that has a PN junction which can be shorted by applying thereacross a predetermined

voltage higher than the breakdown voltage of the junction, said read only memory device comprising:

a quartz substrate;

three adjacent regions laterally disposed on the surface of said quartz substrate, said three adjacent regions comprising a semiconductor middle region and two side regions, one on either side of said middle region, said two side regions each forming a PN junction with said middle region;

an insulating layer disposed over said three regions having two contact holes, one above each of said two side regions;

a control electrode disposed on said second insulating layer overlaying said semiconductor middle region and said PN junctions;

two independent conductors for receiving a voltage therebetween sufficient to destroy one of said PN junctions, one of said conductors connected to one of said two side regions through one of said contact holes and said other of said two conductors connected to said other side region through said other of said contact holes; and

a third conductor connected to said control electrode for applying a predetermined voltage to said control electrode to reduce the voltage applied across said two side regions necessary to breakdown and short one of said PN junctions.

4,538,168

HIGH POWER SEMICONDUCTOR PACKAGE

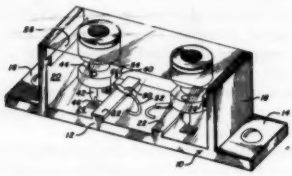
Herman F. Van Dyk Soerewyn, Peabody, Mass., assignor to Unitrode Corporation, Lexington, Mass.

Continuation of Ser. No. 307,106, Sep. 30, 1981, abandoned. This application Apr. 3, 1984, Ser. No. 596,079

The portion of the term of this patent subsequent to Apr. 17, 2001, has been disclaimed.

Int. Cl.³ H01L *23/28, 23/16, 23/02*

U.S. Cl. 357—72 **13 Claims**



1. A high power semiconductor package comprising:

a unitary extruded-metal housing having a bottom plate having ends, first and second end walls upstanding from the bottom plate and spaced from each other and from the ends of the bottom plate defining a planar open top and open side walls, the ends of the bottom plate including means for mounting the housing to a mounting surface;

the housing including a plurality anchor elements integrally formed on at least one end wall and the bottom plate of said unitary extruded-metal housing;

first and second electrical terminals disposed in spaced-apart relation in the housing, each having an outer end protruding from the planar open top of the housing and by which external electrical connection is made, and an inner end within the housing in spaced relation to the bottom plate of the housing;

first and second semiconductor die assemblies;

means for mounting the semiconductor die assemblies to the bottom plate in spaced-apart relation;

means for electrically connecting the first and second die assemblies to the inner ends of corresponding ones of the terminals; and

an encapsulant disposed in the housing between the upstanding end walls thereof, the encapsulant being secured by the anchor elements of the housing.

4,538,169

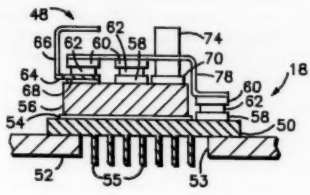
INTEGRATED ALTERNATOR BRIDGE HEAT SINK

William R. Smith, Mesa, and Theodore R. Myers, Phoenix, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 4, 1982, Ser. No. 439,500

Int. Cl.³ H01L *23/32, 23/02*

U.S. Cl. 357—76 **10 Claims**



1. An apparatus for transferring heat from one or more first electronic devices and one or more second electronic devices to a frame, comprising:

a mounting base of heat and electrical conducting material thermally and electrically connected to said frame, said first electronic device connected to a first portion of said mounting base, said mounting base for coupling to receive a first voltage;

a first layer of thermally conductive epoxy adjacent a second portion of said mounting base, said layer being electrically nonconductive; and

a plate of thermal and electrical conducting material adjacent said layer, a first portion of said plate thermally and electrically connected to said second electronic device and for coupling to receive a second voltage, wherein heat generated by said first electronic device may transfer through said mounting base to said frame, heat generated by said second electronic device may transfer through said plate, said material, and said mounting base to said frame.

4,538,170

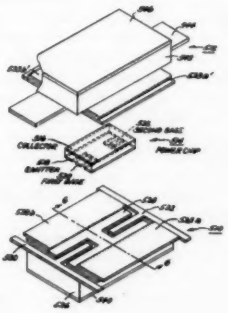
POWER CHIP PACKAGE

Alexander J. Yerman, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 3, 1983, Ser. No. 455,186

Int. Cl.³ H01L *23/08, 23/04, 23/48, 23/12*

U.S. Cl. 357—80 **15 Claims**



1. A power chip package comprising:

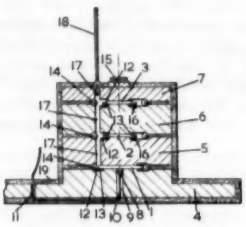
a power chip having a first terminal on one side thereof and a second terminal on the opposite side thereof;
a first dielectric substrate;
a first sheet metal lead attached to one side of said first dielectric substrate and patterned in mirror image fashion to, and attached to, said first terminal;
a second dielectric substrate;
a second sheet metal lead attached to one side of said second dielectric substrate and patterned in mirror image fashion to, and attached to, said second terminal; and
a heat transfer means in heat flow communication with said first and second dielectric substrates for transferring heat between said first and second dielectric substrates, said heat transfer means comprising a plurality of compacted folds of sheet metal interposed between said first and second dielectric substrates.

4,538,171

HIGH POWER SEMICONDUCTOR HEAT SINK ASSEMBLY

Keith D. Stevens; John Harrison, and Stanley B. Kaye, all of Stockport, England, assignors to Cableform Limited, England

Filed Oct. 9, 1981, Ser. No. 310,255
Claims priority, application United Kingdom, Oct. 30, 1980, 8034892; Jun. 5, 1981, 8117292
Int. Cl.³ H01L *23/02, 23/32, 23/42*
U.S. Cl. 357—81 **12 Claims**



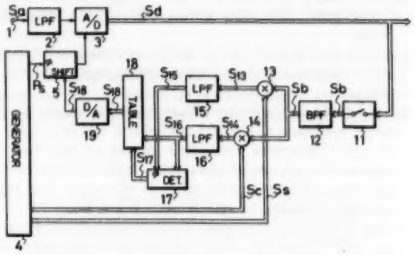
1. A high power semiconductor heat sink assembly comprising: a semiconductor chip; two spaced apart thermally and electrically conductive rigid heat sink plates having substantially parallel facing planar surfaces between which a space is defined and between which the semiconductor chip is clamped so that the width of the space is substantially the same as the width of the chip, the thickness of each plate being substantially greater than the thickness of the space between them, and the facing surfaces of the plates extending a substantial distance beyond the edges of the chip so that a substantial proportion of the space defined between the plates is not occupied by the chip; resilient sealing means sandwiched between the plates and extending around the chip to define with said plates a sealed compartment within which the chip is located; and a thin layer of a solid, electrically nonconductive, thermally conductive material filling the space between the plates outside said compartment, the area of each plate surface in contact with said material being substantially larger than the area of each plate surface in contact with the chip, whereby heat can be rapidly conducted away from the chip through the plates and from one plate to the other.

4,538,172

ANALOG TO DIGITAL CONVERTING SYSTEM FOR COMPOSITE VIDEO SIGNAL

Seiichiro Iwase, Sagamihara, and Shinichi Komori, Isehara, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 16, 1983, Ser. No. 504,739
Claims priority, application Japan, Jun. 17, 1982, 57-104329
Int. Cl.³ H04N *9/46*
U.S. Cl. 358—13 **6 Claims**



1. An analog to digital converting system for a video signal having a pedestal component, comprising:
analog to digital converter means having a signal input terminal, a signal output terminal and a clock input terminal, an analog video signal being supplied to said signal input terminal and a sampling clock signal having a predetermined frequency being supplied to said clock input terminal so that said analog to digital converter means supplies a digital video signal from said output terminal in response to said sampling clock signal;
filter means for filtering said pedestal component from said digital video signal to supply a filtered digital video signal;
burst gate means for deriving a digital burst signal from said filtered digital video signal;
reference signal generator means for generating first and second digital reference signals, each of said reference signals varying in time, and for generating a sampling clock signal;
multiplier means for multiplying said first and second digital reference signals by said digital burst signal to produce first and secod multiplied signals;
DC component detecting means for detecting DC components of said first and second multiplied signals to produce a detector signal therefrom;
phase error calculating means for calculating a phase error of said digital burst signal in said detector signal from said DC component detecting means to produce a phase error signal in response thereto; and
phase shifter means for controlling a phase of said sampling clock signal in response to said phase error signal and supplying a corrected sampling clock signal having a corrected phase to said clock input terminal of said analog to digital converter means.

4,538,173

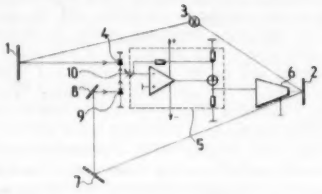
IMPRINT CONTROL SYSTEM WITH FEEDBACK FEATURE

Kari Kirjavainen, Kristianinkatu 7 C 38, 00170 Helsinki 17, and Asko S. Riekkinen, Sepontie 1 E, 02130 Espoo 13, both of Finland

Filed Jan. 4, 1983, Ser. No. 455,471
Claims priority, application Finland, Jan. 4, 1982, 820009
Int. Cl.³ H04N *1/46*
U.S. Cl. 358—75 **12 Claims**

1. A process for controlling formation of an imprint having individual picture elements in reproductive printing by means of an optical system comprising the steps of:

forming an imprint image signal corresponding to the imprint;
forming a set-point image signal;
comparing said imprint image signal with said set-point image signal;



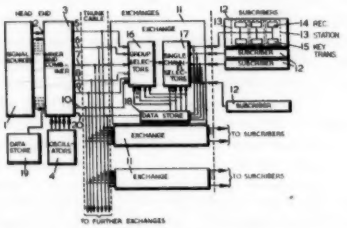
forming an electrical differential signal from the result of comparison thus obtained; and
according to the feedback principle controlling the formation of the imprint of each object under examination.

4,538,174

TWO-WAY SUBSCRIBER TV SYSTEM WITH MULTIPLE SUBSCRIBER'S SETS

Eric J. Gargini, West Drayton, and Henry L. Baker, Northwood, both of England, assignors to Communications Patents Limited, London, England

Filed May 16, 1983, Ser. No. 494,988
Claims priority, application United Kingdom, Mar. 11, 1982, 8306725; May 14, 1982, 8214159
Int. Cl.³ H04N 7/10
U.S. Cl. 358—86 **19 Claims**



1. A communications system comprising at least one exchange, a plurality of television signal sources making signals available at the exchange, a plurality of subscriber's units each connected to the exchange by a respective direct communications link and each provided with a television signal receiver, and selectors located at the exchange for selectively connecting the television signal sources to the communications links, the subscriber's units having transmitters for applying data signals to the respective communications links for transmission to the exchange to control the selectors, wherein each subscriber's unit is associated with a respective exchange located selector controlled by that subscriber's unit's transmitter, the selector associated with at least one subscriber's unit applying television signals to the respective communications link at a frequency to which the subscriber's unit's receiver is tuned, and the subscriber's unit transmitter being responsive to a timing signal transmitted on the communications link from the exchange to apply data signals to the respective communications link, the exchange comprising means responsive to said timing signal to identify the source of data signals received from the subscriber's units wherein at least one of the subscriber's units comprises two subscriber's stations each of which has a respective television receiver and data signal transmitter, and each subscriber's station is associated with a respective exchange located selector controlled by that subscriber's station's transmitter, the selectors associated with the subscriber's stations of said at least one subscriber's unit applying frequency division multiplexed television signals to the respective communications link, each subscriber's station receiver being tuned to receive a respective one of the television signals applied to the communications link, and the subscriber's station's transmitters being responsive at different times to the timing signal to apply time division multiplexed data signals to the communications link, whereby the means at the exchange responsive to the timing signal can identify the source of data signals received on the communications link.

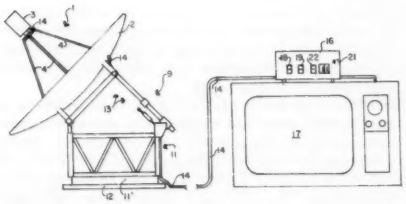
19. A communications system comprising a plurality of subscriber's units each connected to a communications network capable of delivering any one of a plurality of different signals on respective television channels, wherein at least one subscriber's unit is provided with a teletext receiver, means are provided for supplying teletext signals on one television channel of the system, and said at least one subscriber's unit is allocated exclusive use of one teletext sub-page, the content of the said one sub-page being responsive only to data signals supplied by the said at least one subscriber's unit, wherein a first television channel is dedicated to full field teletext signals, and a second channel is dedicated to provide interactive services, means being provided such that if the said at least one subscriber's unit transmits data over the system in response to information on the second channel a system response is transmitted on the sub-page of teletext dedicated to that subscriber's unit, the subscriber's unit's selector at the exchange being automatically controlled to momentarily connect the teletext receiver to the said first channel such that the data transmitted on the dedicated sub-page is acquired and inlaid on the picture received from the said second channel.

4,538,175

RECEIVE ONLY EARTH SATELLITE GROUND STATION

Michael S. Balbes; Charles E. Day; Robert L. Hooper, and Hank S. Lin, all of Ocala, Fla., assignors to Microdyne Corporation, Ocala, Fla.

Filed Jul. 11, 1980, Ser. No. 168,665
Int. Cl.³ H04N 7/10
U.S. Cl. 358—86 **20 Claims**



1. An earth satellite ground station having an antenna with a focal point,
an antenna feed adapted to be supported at the focal point of the antenna,
a wave guide positioned to receive energy from said antenna feed,
a housing disposed about said feed and said wave guide,
a frequency agile receiver disposed within said housing for producing an IF signal,
a lead, and
means disposed within said housing for receiving said IF signal and producing modulated subcarrier signals on said lead for direct application to the audio and video signal processing circuits of a television set.

4,538,176

BUFFER MEMORY DISPERSION TYPE VIDEO/AUDIO TRANSMISSION SYSTEM

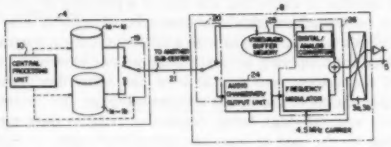
Hirohito Nakajima, Tokyo; Katsumi Haji, Narashino; Yoji Shibata, and Wataru Kosuge, both of Yokohama, all of Japan, assignors to Hitachi, Ltd. and Nippon Telegraph & Telephone Public Corporation, both of Tokyo, Japan

Filed Nov. 26, 1979, Ser. No. 97,364

Claims priority, application Japan, Nov. 24, 1978, 53-144160

Int. Cl.[3] H04N 7/10

U.S. Cl. 358—86 5 Claims



1. A buffer memory dispersion type video/audio transmission system comprising:

a plurality of subscriber terminal units each including a telephone set and/or a keyboard, a video-audio receiver, and a converter for converting a video signal and an audio signal transmitted in a base band to a standard television signal;

a center including a group of audio files for storing audio information and a group of video files for storing video information, and a central processing unit responsive to a requesting command received from said subscriber terminal units for fetching specific video and/or audio information from said files and for transmitting the fetched information in time division multiplex form;

a plurality of sub-centers each accommodating thereto a plurality of said subscriber terminal units and each including a plurality of video and audio buffer memories for temporarily storing specific video information and specific audio information received from said center in time division multiplex form, a D/A converter for digital to analog converting the information of said audio buffer memory, a modulator for modulating a carrier wave by the audio information, and exchange means for combining outputs of said D/A converter and said modulator and for connecting said sub-center to a subscriber terminal lunit requesting information; and

a first transmission line connecting said sub-centers in common to said center and a plurality of second transmission lines connecting the respective sub-centers to a respective subscriber terminal unit, the length of said second transmission lines being shorter than the length of said first transmission line, said first transmission line enabling transmission in time division multiplex form and said second transmission lines enabling transmission in base band form.

4,538,177

AUTOMATIC EQUIPMENT

John M. Morison, Edinburgh, Scotland, assignor to plc Ferranti, London, England

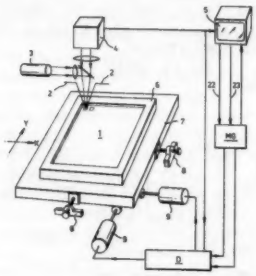
Filed Nov. 21, 1983, Ser. No. 553,970

Claims priority, application United Kingdom, Nov. 27, 1982, 8233908

Int. Cl.[3] H04N 7/18

U.S. Cl. 358—101 2 Claims

1. Automatic equipment, to be employed in association with devices each having constituent features detectable by a radiation sensitive device, the features having only straight line boundaries and axes of symmetry, the features forming an orthogonal pattern extending parallel to orthogonal axes associated with a plane including the device features, and each device having a shape in plan enabling it to co-operate with means provided within the automatic equipment so as to be located without any angular misalignment in relation to the two orthogonal axes of the device plane, and the automatic equipment also including displacing means by which each device is displaceable within the automatic equipment, along either orthogonal axis of the device plane, and relative to co-operative parts of the automatic equipment, inspection means having a radiation sensitive device, at least considered as, being arranged to move, at a constant speed, and in relation to each device, individually, along a predetermined raster scanning path of parallel lines in a plane, parallel to the plane including the device features, there being two orthogonal axes of symmetry associated with the raster scanning pattern, one such axis being parallel to the scanning lines, and both axes being parallel to the two orthogonal axes of the plane including the device features, and the radiation sensitive device being arranged to produce signals in response to the detection of boundaries of features in the plane of the device; the inspection means also including manually adjustable marker generating means, arranged to produce associated pairs of groups of signals, with each group including at least one signal, in each raster scan period, the time interval between the signals of each such associated pair of signals representing a particular distance of movement of the radiation sensitive device, along an



axis parallel to one of the two orthogonal axes of the raster scan pattern, so that each such associated pair of groups of signals represents a marker within the raster scan pattern, considered as being capable of being superimposed upon the device plane, and considered as being detactable by the radiation sensitive device, in addition to the detection thereby of the device feature boundaries, each marker representing, individually, a particular distance at a location within the raster scan pattern, each signal produced by the marker generating means representing a line in the raster scan pattern considered as being detected by the radiation sensitive device simultaneously with the production of the signal; in an initial setting operation of the automatic equipment, with an operator having determined a unique pattern of feature boundaries, in the plane of each device, the operator adjusts the marker generating means to produce a plurality of associated pairs of groups of signals, each of the associated pairs of groups of signals, considered individually, defining a location within the raster scan pattern of a determined feature boundary of the unique pattern of feature boundaries, in relation to each device positioned within the automatic equipment, and considered sequentially, the defined location of a feature boundary being considered to be a line in the raster scan pattern extending parallel to the orthogonal axis parallel to the feature boundary, and equidistant between the lines in the raster scan pattern represented by the corresponding associated pairs of groups of signals, and the adjustment of the marker generating means by the operator to

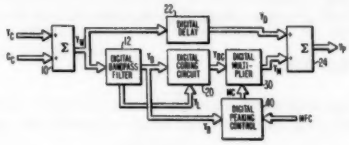
be such that the feature boundary location defining line, in the raster scan pattern, is within a predetermined distance from the desired accurate location of the feature boundary in the raster scan pattern, and along an axis parallel to the orthogonal axis at right angles to the feature boundary, different markers being so adjusted in relation to different determined feature boundaries of the unique pattern of feature boundaries, each of the determined feature boundaries, individually, having a marker so adjusted in relation thereto; the automatic equipment also including discriminating means to operate upon, individually, each combination of related signals produced by the inspection means, each such a combination of related signals comprising the associated pair of groups of signals from the marker generating means corresponding to a feature boundary, together with a signal from the radiation sensitive device indicative of the detection of the feature boundary, in relation to each device, at least, coarsely positioned within the automatic equipment, as defined below, and each device being considered sequentially, the discriminating means being arranged to be capable of detecting whether, individually, each of the plurality of determined feature boundaries of the unique pattern of feature boundaries, is located within a threshold distance from the defined location of the feature boundary, and along an axis parallel to the orthogonal axis at right angles to the feature boundary, each threshold distance being at most equal to half the appropriate particular distance; the automatic equipment being set up such that when the discriminating means operates upon each combination of related signals associated with any device, and when each of the plurality of determined feature boundaries, considered individually, is detected by the discriminating means to be within an appropriate combined distance from its desired accurate location within the automatic equipment, the appropriate combined distance comprising the appropriate threshold distance plus the appropriate predetermined distance, the device is located within the automatic equipment so as to be inherently capable of co-operating with the co-operative parts of the automatic equipment, and, then, in relation to any device instantaneously being considered, when the discriminating means detects that each of the plurality of determined feature boundaries, is within the appropriate combined distance from its desired accurate location, or within the appropriate threshold distance from its defined location, the device is considered to be precisely positioned within the automatic equipment; and the automatic equipment including means whereby each of a plurality of identical devices, sequentially, and automatically, is, at least, coarsely positioned within the automatic equipment, the device being located so as not to be inherently capable of co-operating with the co-operative parts of the automatic equipment, each device being considered to be coarsely positioned when the discriminating means is capable of operating upon each combination of related signals associated with the device, but, in response, the discriminating means detecting that at least one of the plurality of determined feature boundaries is not located within the appropriate threshold distance from its defined location in the raster scan pattern; in a constituent error determining step, of a device positioning operation of the automatic equipment, the discriminating means detecting whether the device is precisely positioned within the automatic equipment, and in response to the detection by the discriminating means that the device is not so precisely positioned, the discriminating means, which is arranged to control the device displacing means, causing the displacing means to displace the device, whereby the device, at least approaches, being precisely positioned within the automatic equipment, the constituent error determining step being repeated automatically in the device positioning operation, until the discriminating means detects that the device is precisely positioned within the automatic equipment.

4,538,178

DIGITAL SIGNAL PEAKING APPARATUS WITH CONTROLLABLE PEAKING LEVEL

Thomas V. Bolger, Merchantville, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jun. 24, 1983, Ser. No. 507,554
Int. Cl.³ H04N 5/14
U.S. Cl. 358—166 **19 Claims**



1. Digital signal processing apparatus comprising:

a source for providing digital input signals to be processed;

digital filtering means coupled to said source for developing filtered digital signals including relatively higher frequency components of said digital input signals;

scaling means coupled to said digital filtering means for scaling the magnitudes of said filtered digital signals in accordance with a scaling signal to develop scaled digital signals;

combining means, coupled to said source and to said scaling means, for combining said input digital signals and said scaled digital signals to produce processed digital signals; and

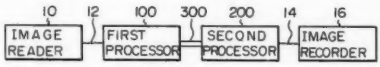
control means coupled to said digital filtering means for developing said scaling signal in response to said filtered digital signals and coupled to said scaling means for applying said scaling signal thereto.

4,538,179

IMAGE PROCESSING FOR UNSHARP MASKING OF IMAGE

Kimura Tsutomu; Hideo Nakayama, and Yuichi Fuseda, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 11, 1983, Ser. No. 493,55[illegible]
Claims priority, application Japan, May 19, 198[illegible]/84571
Int. Cl.³ H04N 5/30, 1/40
U.S. Cl. 358—166 **4 Claims**



1. An image processing system comprising:

video signal input means for receiving an original video signal S_{org} associated with a pixel involved in an original image, the original video signal S_{org} being formed by scanning the original image;

operational circuitry interconnected to said input means for executing an unsharp masking processing in accordance with an expression defined by

$$S' = \gamma \left[S_{org} + \beta(S_{org} - S_{us}) \left(S_{org} - \sum_{p=1}^{\rho} \frac{\alpha_p M_{p\Sigma} \cdot N_{pS_{org}}}{M_p \cdot N_p} \right) \right] ,$$

to produce a resultant signal S' with respect to a rectangular area formed by N_p scanning lines each including M_p pixels and defined by two lengths of line which are substantially parallel to the direction of a scanning line and two lengths of line which are substantially perpendicular

to the direction of a scanning line, wherein α_p is a weight, β is an emphasis function, γ is a nonlinear function, M_p, N_p and P are a natural number, and p is one of P;

video signal producing means interconnected to said operational circuitry for producing the resultant signal S' calculated from the expression as a video signal to be reproduced of the original image; wherein said operational circuitry comprises:

first and second processors interconnected with each other;

said first processor executing operations on the term

$$M_{p\Sigma} \cdot N_{pS_{org}}$$

in the expression sequentially with respect to the rectangular areas of the original image to transfer the results

$$M_{p\Sigma} \cdot N_{pS_{org}}$$

together with the associated original video signals S_{org} to said second processor;

said second processor being in response to the results

$$M_{p\Sigma} \cdot N_{pS_{org}}$$

and the associated original video signals S_{org} to execute operations on the remaining portions of the expression sequentially with respect to the rectangular areas to form the resultant signal S'.

4,538,180

SYSTEM FOR NON LINEARITY CORRECTION BY INTERMEDIATE FREQUENCY PREMODULATION IN TELEVISION EQUIPMENT

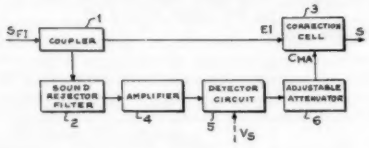
Claude Cluniat, Chatou, France, assignor to LGT Laboratoire General des Telecommunications, Chatou, France

Filed Jan. 13, 1983, Ser. No. 457,624

Claims priority, application France, Jan. 28, 1982, 82 01354

Int. Cl.³ H04N *5/38, 5/40*

U.S. Cl. 358—186 **9 Claims**



1. A system for pre-correcting, by intermediate frequency pre-modulation, non-linearities introduced into a high frequency amplified television signal in common channel transmission equipment having intermediate frequency stages, comprising at least one group delay time correction cell receiving said signal and having an output and placed in said intermediate frequency stages, including:

a direct channel receiving said signal and having an output;

a compensated channel receiving said signal and having an output which when added to said direct channel output comprises said cell output, including:

an amplifier receiving said signal; and

a group delay time modulation circuit, connected to said amplifier, for introducing group delay time corrections to said signal at a frequency of a correction pole, said delay time modulation circuit having a group delay time control input and including an oscillating circuit for tuning said delay time modulation circuit to said correction pole frequency, said delay time modulation circuit having no effect on an amplitude of said signal at said correction pole frequency; and

an amplitude pre-modulation control circuit, having a control input and an output which is connected to said amplifier, for introducing amplitude corrections of said signal at said correction pole frequency in a manner independent of said group delay time corrections.

4,538,181

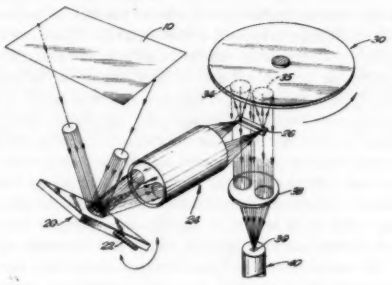
OPTICAL SCANNER

William H. Taylor, South Deerfield, Mass., assignor to Kollmorgen Technologies, Dallas, Tex.

Continuation-in-part of Ser. No. 470,499, Feb. 28, 1983,. This application Apr. 6, 1984, Ser. No. 597,645

Int. Cl.³ H04N *3/08*

U.S. Cl. 358—208 **60 Claims**



9. In a scanning system wherein a scene is scanned in an orthogonal pattern including linear scanning traces in one of the orthogonal directions focused at a locus of foci, the improvement comprising:

a rotating scanning disc including a circular array of concave reflectors on a plane surface thereof;

an image means configured and dimensioned to coincide with the locus of foci and on which the linear scanning trace appears such that said image means redirects the focused radiation of the scanning trace to the concave reflectors; and

radiation detecting means positioned to detect the intensity of radiation reflected from said image means by said concave reflectors.

4,538,182

IMAGE PROCESSING APPARATUS

Seiji Saito, Yokosuka; Naoki Ayata, Machida; Hidetoshi Suzuki, Tokyo; Kunitaka Ozawa, Azumabashi, and Noboru Koumura, Narashino, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 3, 1982, Ser. No. 374,102

Claims priority, application Japan, May 11, 1981, 56-69316; May 26, 1981, 56-78699; May 27, 1981, 56-79292; May 28, 1981, 56-80045; Jun. 5, 1981, 56-85622; Jun. 10, 1981, 56-88008; Jun. 11, 1981, 56-88824; Jun. 25, 1981, 56-97453; Oct. 8, 1981, 56-159390; Nov. 17, 1981, 56-184634

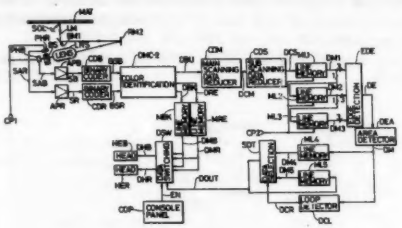
Int. Cl.³ H04N *1/40*

U.S. Cl. 358—280 **31 Claims**

1. Image processing apparatus comprising:

outputting means for outputting an image signal containing area specifying data;

detecting means for detecting a duration of the image signal output by said outputting means; and



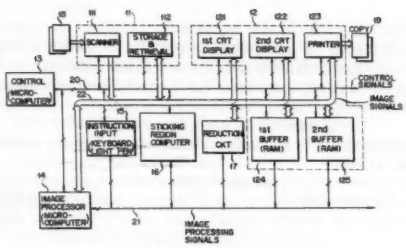
means for discriminating the area specifying data in accordance with the duration detected by said detecting means.

4,538,183

IMAGE EDITING APPARATUS

Masayuki Kanno, Fujisawa; Hisao Tezuka; Kouji Izawa, both of Yokohama, and Tadanobu Kamiyama, Yokosuka, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 28, 1982, Ser. No. 454,110
Claims priority, application Japan, Jan. 8, 1982, 57-887
Int. Cl.³ H04N *1/40*
U.S. Cl. 358—280 **13 Claims**



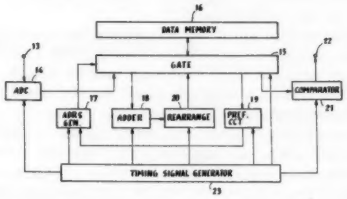
1. A cut-and-paste image editing apparatus comprising:
input means for separately inputting documents each having image information to be edited;
display means for displaying each of the documents;
cutting region designating means for designating at least one cutting region of a document displayed on said display means and providing coordinate information of the cutting region;
first image information storing means for storing image information of each cutting region designated by said cutting region designating means;
pasting region computing means storing in advance a plurality of basic pasting patterns each representing a layout for pasting a plurality of cutting regions on a sheet, and responsive to the coordinate information of said cutting regions provided by said cutting region designating means for judging whether the cutting regions can be pasted on the sheet according to each of the basic pasting patterns, computing the coordinates of pasting regions corresponding to the cutting regions for each of basic pasting patterns which have been so judged, and storing the coordinate information of each of the pasting regions;
second image information storing means having storage areas each corresponding to a size of a sheet on which a plurality of cutting regions are pasted according to a basic pasting pattern;
means for transferring the image information of the cutting regions stored in said first image information storing means to locations of the storage area of said second image information storing means, designated by the coordinate information of the corresponding pasting regions stored in said pasting region computing means for each pasting pattern according to which the cutting regions can be pasted; and
means for outputting the image information of the cutting regions stored in said second image information storing means in a form such that the cutting regions have been pasted on a sheet according to at least one of the basic pasting patterns which have been judged that the cutting regions can be pasted.

4,538,184

METHOD AND APPARATUS FOR PROCESSING VIDEO SIGNALS

Hirotaka Otsuka, Kawasaki; Katsuo Nakazato, Tokyo; Kunio Sannomiya, Atsugi; Hidehiko Kawakami, Tokyo; Hiroyoshi Tsuchiya, Kawasaki, and Hideo Uchida, Tokyo, all of Japan, assignors to Matsushita Electric Industrial Company, Limited and Matsushita Graphic Communication Systems, Inc., both of, Japan

Filed Jun. 7, 1983, Ser. No. 501,873
Claims priority, application Japan, Jun. 7, 1982, 57-97938; Jun. 18, 1982, 57-106063; Sep. 29, 1982, 57-171643
Int. Cl.³ H04N *1/40*
U.S. Cl. 358—283 **6 Claims**



1. A method for processing a video signal, characterized by a first step of storing a video signal derived from each picture element of a scanned original into a video memory, a second step of establishing a scan window in said memory such that the scan window comprises M picture elements adjacent to each other (where M is a natural number), a third step of determining the total sum S of the signal levels of all of said picture elements in said scan window and determining N and A which satisfy the following formula:

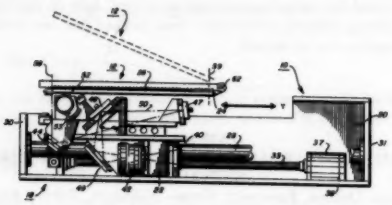
$$S=C\times N+A$$

where C represents a given video signal level, N is an integer and $0 \leqq A < C$, and a fourth step of identifying each of said picture elements in said scan window with an increasing or decreasing number in the order of signal level, and if in the decreasing order, transforming the signal levels of the picture elements #1 through #N to a signal level C, transforming the signal level of the picture element #(N+1) to a signal level A, transforming the signal levels of the picture elements #(N+2) through #M to a signal level zero, and if in the increasing order, transforming the signal levels of the #1 through #(M−N−1) picture elements to zero, transforming the signal levels of the #(M−N) picture elements to A, transforming the signal levels of the picture elements #(M−N+1) through #M to C, and repeating said second, third and fourth steps with respect to all the stored areas of said memory while shifting said scan window by a predetermined number of picture elements.

4,538,185
PLATEN COVER FOR DOCUMENT BOUNDARY DETECTION IN RASTER SCANNERS

Douglas G. Wiggins, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 30, 1983, Ser. No. 538,037
Int. Cl.³ H04N *1/04, 1/40, 1/10, 1/02*
U.S. Cl. 358—285 **11 Claims**



1. In a raster input scanner having a platen for supporting the document to be scanned and at least one scanning array for scanning the document image to produce image signals of varying potentials representative of the document image for output, the combination comprising:

(a) a cover member; and

(b) means supporting said cover member for movement into and out of overlaying relation with said platen and the document thereon,

said cover member being sized to cover said platen on closure of said cover member,

the inside surface of said cover member facing said platen being corrugated and reflective to provide a relatively coarse specular light reflecting surface which when scanned reflects a relatively bright intense image distinguishable from the document image;

said scanning array producing image signals of maximum potential when scanning said cover specular reflective surface; and

(c) control means for controlling the output of image signals to avoid output of unnecessary image signals representing areas outside the document perimeter, including

means establishing a preset reference potential greater than the image signal potentials produced by scanning said document image but less than the maximum potential produced by scanning said cover specular light reflecting surface, and

means for preventing output of image signals when the image signal potential is above said preset reference signal potential.

4,538,186
METHOD AND APPARATUS FOR DISTRIBUTING LEADING SPACE

David E. Adsett, Charlton Kings, England, assignor to Allied Corporation, Morris Township, Morris County, N.J.

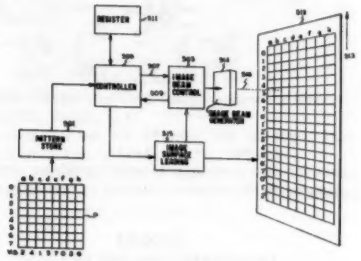
Filed Apr. 22, 1982, Ser. No. 370,777
Claims priority, application United Kingdom, May 28, 1981, 8116389
Int. Cl.³ H04M *1/24*
U.S. Cl. 358—298 **12 Claims**

1. A method of interspersing a leading space of a first width produced between pairs of a series of images formed by deflection of an imaging beam, by a leading step in a first direction over a plurality of lines separated by a leading space of a second width produced by said leading step in said first direction, and wherein said lines are formed by image areas in a graphic image located on an imaging surface having at least first and second dimensions extending in said respective first and second directions and comprising the steps of:

a. deriving signals indicative of the information content of said image areas,

b. reproducing said image areas, responsive to said signals, on said image surface at predetermined locations, to form a succession of said lines of said images in said second direction,

c. and, wherein said step of reproducing includes the steps of

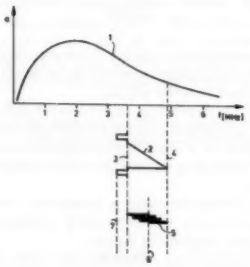


spacing said reproduced image areas in separate leading steps, producing leading spaces of said second width in said first direction to form said succession of said lines extending in the said second direction, and the step of interspersing one said leading space of said first width, produced between the pairs of said images in said leading space of said second width between a plurality of said line of images.

4,538,187
METHOD OF AND CIRCUIT ARRANGEMENT FOR RECORDING A COLOR VIDEO SIGNAL

Karl H. Rehfeldt, Quickborn, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 10, 1982, Ser. No. 416,752
Claims priority, application Fed. Rep. of Germany, Sep. 14, 1981, 3136347
Int. Cl.³ H04N *9/493*
U.S. Cl. 358—330 **5 Claims**



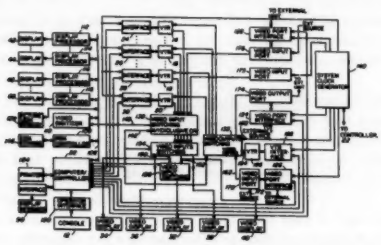
1. A method for recording the information contained in a colour video signal, which signal comprises a luminance signal and two alternately transmitted colour-difference signals, on a record carrier, in particular a magnetic tape, by frequency modulation, recording being effected in the range of the falling portion of the frequency-amplitude transmission curve, including recording the colour-difference signals (R-Y) and (B-Y) with negative polarity in such a way that the amplitude values of bright colour such as a yellow, cyan and green are recorded at a higher frequency value and, consequently, at lower values of the frequency-amplitude transmission curve, and darker colours such as purple, red and blue are recorded at higher values of the frequency-amplitude transmission curve.

4,538,188

VIDEO COMPOSITION METHOD AND APPARATUS

Ronald C. Barker, Weston, and Chester L. Schuler, Sudbury, both of Mass., assignors to Montage Computer Corporation, West Concord, Mass.

Filed Dec. 22, 1982, Ser. No. 452,287
Int. Cl.³ H04N *5/782*; G11B *27/02*
U.S. Cl. 360—14.3 **67 Claims**



1. Composing apparatus for selecting segments from image source material stored in at least one storage medium and for denoting serially connected sequences of said segments, said apparatus comprising

a pictorial display means,

an operator control means, and

a composing control means responsive to said operator control means for controlling said storage media and said pictorial display means, said composing control means comprising

means for denoting a start and an end of each of a plurality of segments of said source material,

means for identifying each said segment by a pictorial image segment label,

means for selectively displaying segments of said image source material on said pictorial display means,

means for assembling at least a plurality of said labels into a serially connected label sequence,

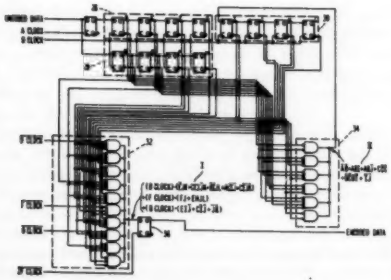
operator responsive means for locating any said segment by displaying said pictorial labels in said label sequence, and said displaying means being further adapted for displaying the segment identified by a selected label.

4,538,189

(1,8) DATA ENCODER/DECODER

William B. Fitzpatrick, Sunnyvale, Calif., assignor to Storage Technology Corporation, Louisville, Colo.

Filed Feb. 6, 1984, Ser. No. 577,510
Int. Cl.³ G11B *5/09*
U.S. Cl. 360—40 **6 Claims**



1. A disk drive for storing data received from a host computer comprising:

magnetic disk storage media;

read/write head means for writing data to said disk and reading data from said disk;

data encoding circuitry for encoding data received from the host computer according to (1,8) run-length-limited, variable length code word encoding techniques; and

data decoding circuitry for decoding (1,8) encoded data read from said disk into a stream of data suitable for outputting to said host;

wherein said encoding circuitry comprises first, second and third shift registers, each comprising four stages, each of those stages outputting a signal;

the signals output by the stages of said first shift register being denominated A, C, E and G, respectively;

the signals output by the stages of the second shift register being denominated B, D, F, and H respectively;

the signals output by the stages of the third shift register being denominated I, J, K and L, respectively;

clock means for outputting D clock, F clock, and B clock signals; and

first and second group of logic circuitry, said first group of logic circuitry outputting a signal equivalent to the Boolean logic statement I, where

$$I=(\text{D clock}).(\overline{E}JK+CE\overline{I}K+\overline{E}GJL+AC\overline{I}+C\overline{E}J\overline{K})+(\text{F clock}).(FJ+EHJL)+(\text{B clock}).(E\overline{I}J+C\overline{I}+\overline{J}K),$$

as the encoded data signal, and the second group of logic circuitry outputting a signal equivalent to the Boolean logic statement II, where

$$II=\overline{A}\overline{B}+ABI+AB\overline{J}+C\overline{D}I+\overline{B}CD\overline{I}+\overline{I}D,$$

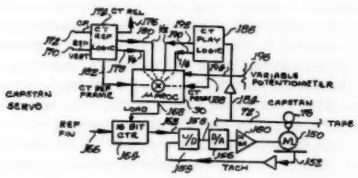
supplied to said third shift register.

4,538,190

PROGRAMMABLE NON-LINEAR SPEED CONTROL FOR A RECORDING AND/OR REPRODUCING APPARATUS

Kenneth Louth, Los Altos, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Continuation of Ser. No. 364,962, Apr. 2, 1982, abandoned. This application Sep. 4, 1984, Ser. No. 647,260
Int. Cl.³ G11B *15/44*
U.S. Cl. 360—73 **20 Claims**



9. A nonlinear speed control apparatus for varying the transport speed of tape in a magnetic tape recording and reproducing machine, comprising:

means for transporting the tape at a speed proportional to a parameter of a driving signal;

movable means having positional settings for providing a speed control signal which varies with the positional setting of said movable means; and

means responsive to the speed of the tape and to said speed control signal for varying said parameter of said driving signal in a non-linear fashion with incremental changes in said speed control signal to produce a smaller percentage change in the speed of the tape at relatively faster speeds and a greater percentage change at slower speeds.

13. A speed control apparatus for varying the transport

speed of a tape in a magnetic tape recording and reproducing machine, comprising:

means for transporting the tape at a speed proportional to the parameter of a driving signal; movable means having positional settings for providing a speed control signal which varies with the positional setting of said movable means; and

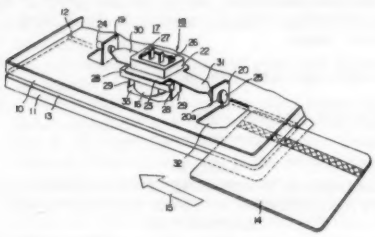
means responsive to the speed of the tape and to said speed control signal for varying said parameter of said driving signal with a delay between the time that a change occurs in said speed control signal and the time that the corresponding variation in said parameter occurs, said delay being proportional to the speed of the tape in the range of normal playback speed and above.

4,538,191

MAGNETIC CARD READER

Akihiro Suzuki, Okazaki; Keiichi Souda; Masao Kuno, both of Kariya, and Hiroshi Ikuta, Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 7, 1982, Ser. No. 395,982
Claims priority, application Japan, Jul. 8, 1981, 56-107294
Int. Cl.³ G11B *17/00*
U.S. Cl. 360—88 **19 Claims**



1. A magnetic card reader, comprising:

guide members including an interior card path having space larger than the thickness of a magnetic card for guiding the movement of the magnetic card; and

holding means provided in said guide members for holding a transducer to face said path, said transducer reading data recorded on said magnetic card when said magnetic card is moving by it; said holding means including

a movable assembly including a holding frame for holding said transducer, a pair of elastic members, with ends, extending in the direction of movement of said magnetic card in a manner to hold said holding frame and a pair of bar-shaped members, with respective outer peripheries adapted to permit rotation thereof, formed at the ends of the elastic members, said bar-shaped members extending in the direction of movement of the magnetic card,

a pair of support members for supporting said bar-shaped members by contacting the respective outer peripheries thereof, said support members supporting said movable assembly with respect to said guide members along a rotational axis having a direction parallel to the direction of movement of said magnetic card, and

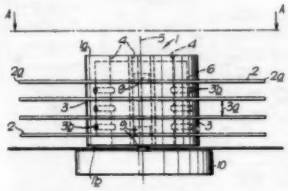
paired positioning members respectively provided on one of said guide members on opposite sides of said holding frame for engaging said pair of elastic members urge said pair of elastic members away from said one guide member to place said elastic members so as to define an initial position of said transducer.

4,538,192

VENTILATION SYSTEM FOR COMPUTER DISC DRIVE HUB ASSEMBLY

James N. J. White, Kinross, and Michael G. Caithness, Fife, both of Scotland, assignors to Rodime Limited, United Kingdom

Filed Jun. 14, 1982, Ser. No. 388,165
Int. Cl.³ G11B *5/012*
U.S. Cl. 360—98 **2 Claims**



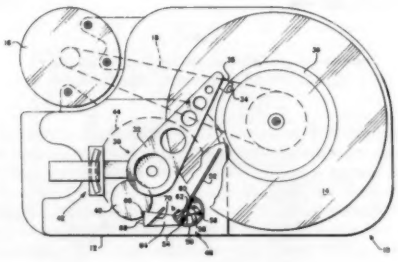
1. A computer disc drive including a hub assembly supporting a plurality of axially-stacked discs and a housing defining a chamber, said chamber enclosing said hub assembly, said hub assembly having a plurality of axially extending channels interconnecting the space adjacent the axial ends of the hub with the spaces between the discs via a plurality of radially extending channels, said housing having air ventilating and filtering means therein, said ventilating and filtering means comprising a breather filter located in said housing co-axially with the axis of the hub assembly, said breather filter interconnecting the interior of the chamber with the outside atmosphere, the air enclosed by the chamber being circulated within the chamber via said axially and radially extending channels by the pumping action of the rotating discs, said circulation of air causing pressure gradients to be established within the chamber wherein the spaces adjacent the axial ends of said hub assembly are the points of lowest pressure, said points of lowest pressure being at atmospheric pressure by virtue of the co-axial location of said breather filter.

4,538,193

AERODYNAMICALLY RELEASED SAFETY LATCH FOR DATA TRANSDUCER ASSEMBLY IN ROTATING RIGID DISK DATA STORAGE DEVICE

W. Scott Dimmick, Atherton; Charles S. Mitchell, Portola Valley, and William G. Moon, Sunnyvale, all of Calif., assignors to Quantum Corporation, Milpitas, Calif.

Filed Nov. 8, 1982, Ser. No. 439,897
Int. Cl.³ G11B *21/20*
U.S. Cl. 360—137 **17 Claims**



1. In a data storage device including a frame and one or more rigid rotating disks, at least one data transducer capable of riding in close proximity to a data storage major surface of said disk upon an air bearing created by rotation of said disk for writing and reading data on said surface, a transducer support

carriage for supporting and moving said data transducer relative to said surface, and including a rest position for said transducer, and driver means for moving said carriage,

an improved safety latch for locking said transducer at its rest position in the absense of disk rotation and for releasing in response to air flow generated by disk rotation, said latch comprising:

moveable airvane means disposed adjacent to said rotating disk, said airvane means being biased to a first position in opposition to the direction of airflow generated by disk rotation, said airvane means for moving in response to airflow generated by disk rotation to a second position in the direction of airflow,

moveable latch means connected to said airvane means, said latch means for engaging said carriage to lock said transducer at said rest position when said airvane means is at said first position, and for releasing said carriage when said airvane means moves to said second position in response to airflow, and

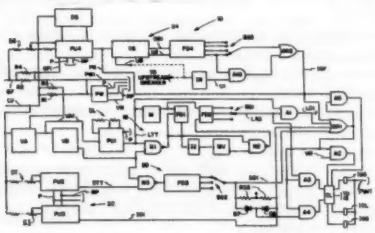
bias means for providing a predetermined bias to said airvane means to urge it to said first position, said predetermined bias being overridden by airflow generated by disk rotation enabling said airvane means to move to said second position.

4,538,194

GROUND FAULT DESENSITIZATION CIRCUIT FOR ELECTRONIC BREAKER

Henry J. Zylstra, Alburnette, and Harley W. Jansen, Marion, both of Iowa, assignors to Square D Company, Palatine, Ill.

Filed May 9, 1983, Ser. No. 492,516
Int. Cl.³ H02H *3/16*
U.S. Cl. 361—42 **20 Claims**



1. A circuit breaker having interruption means operable for interrupting a plurality of line conductors with each conductor having a respective current transformer for sensing the current in the respective line conductor and for deriving a signal corresponding to the overcurrent present in the respective line conductor the improvement comprising:

ground fault means for detecting a ground fault current in any one of said conductors and for thereafter operating said interrupting means to interrupt said line conductors,

a desensitization circuit responding to a signal above a first predetermined level derived from any of said conductors,

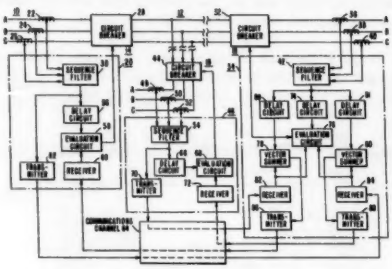
and means in said desensitization circuit for preventing said ground fault means from operating said interruption means for a predetermined time period in response to the detection of said signal exceeding a first predetermined value for preventing interruption of said line conductors during the detection of said ground fault current.

4,538,195

THREE TERMINAL CURRENT DIFFERENTIAL PROTECTIVE RELAY

Walter A. Elmore, Coral Springs, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 22, 1984, Ser. No. 582,344
Int. Cl.³ H02H *7/26*
U.S. Cl. 361—64 **7 Claims**



1. A current differential protective relay system for detecting a fault on an ac electric power network having first, second, and third terminals, and for opening a circuit interrupter at each terminal thereof, said current differential protective relay system comprising:

means responsive to the current at each of the first, second, and third terminals of the electrical power network for producing a first current signal at the first terminal, a second current signal at the second terminal, and a third current signal at the third terminal;

first communications means for communicating said first current signal to the second terminal;

second communication means for communicating said third current signal to the second terminal;

first summing means at the second terminal for producing a first sum signal representative of the vector sum of said first and second current signals;

second summing means at the second terminal for producing a second sum signal representative of the vector sum of said second and third current signals;

third communications means for communicating said first sum signal to the third terminal;

fourth communications means for communicating said second sum signal to the first terminal; and

comparator means at each of the first, second, and third terminals for logically relating said first current signal and said second sum signal at the first terminal, for logically relating said first, second, and third current signals at the second terminal, and for logically relating said third current signal and said first sum signal at the third terminal, to detect a fault on the electrical power network and for tripping the circuit interrupter at the first, second, and third terminals.

4,538,196

PROTECTIVE RELAY APPARATUS AND METHOD FOR PROVIDING SINGLE-POLE TRIPPING

Shan C. Sun, and James P. Garitty, both of Coral Springs, Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

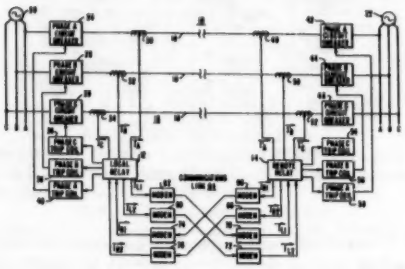
Filed Apr. 22, 1983, Ser. No. 487,480
Int. Cl.³ H02H *3/30*
U.S. Cl. 361—64 **38 Claims**

1. A phasor-comparison protective-relay system detecting the faulted phase conductor of a three-phase ac transmission line section having a circuit interrupter on each of the first, second, and third phase conductors at each of the local and

remote terminals thereof, said phasor-comparison protective-relay system comprising:

means at each of the local and remote terminals responsive to first, second, and third electrical parameters thereat for providing first and second local derived signals at the local terminal, and first and second remote derived signals at the remote terminal;

means at each of the local and remote terminals for transmitting said first and second local derived signals to the remote terminal and for transmitting said first and second remote derived signals to the local terminal;



means at each of the local and remote terminals for expanding said first and second derived signals received from the other into first, second, and third local comparison signals at the local terminal and first, second, and third remote comparison signals at the remote terminal;

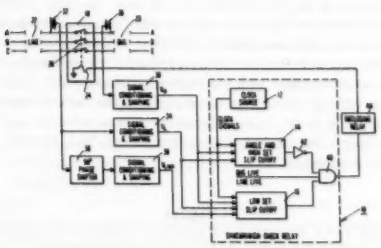
and comparator means at each of the local and remote terminals for logically relating said first, second, and third local comparison signals at the local terminal and said first, second, and third remote comparison signals at the remote terminal to detect the faulted phase conductor and for tripping the circuit interrupter on the faulted phase conductor at each of the local and remote terminals.

4,538,197

SYNCHRONISM CHECK RELAY

Thomas B. Breen, Lansdowne, Pa., assignor to General Electric Company, King of Prussia, Pa.

Filed Jan. 18, 1984, Ser. No. 571,967
Int. Cl.³ H02H *7/22*
U.S. Cl. 361—71 **27 Claims**



1. An apparatus for determining synchronism between first and second voltages present on opposite sides of an open circuit breaker in an AC power distribution system, said apparatus comprising:

a. means for setting a closing angle limit θ;

b. means for setting a high slip frequency limit F_H;

c. means for setting a low slip frequency limit F_L;

d. means for measuring phase angle difference ϕ between said first and second voltages;

e. means for measuring slip frequency F_S between said first and second voltages;

f. means for comparing ϕ with θ and generating a circuit breaker reclose enable signal whenever ϕ remains less than θ for a predetermined period of time T_H which is a function of F_H; and

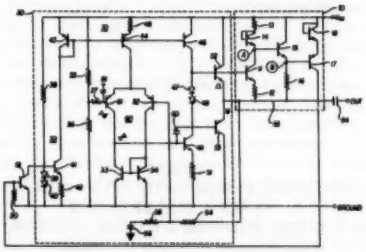
g. means for detecting predetermined low set measurement conditions and, whenever said measurement conditions are detected, comparing F_S with F_L and preventing the generation of said reclose enable signal when F_S is greater than F_L.

4,538,198

PROTECTION CIRCUIT FOR AN OUTPUT TRANSISTOR

Kazuo Imanishi; Masaru Hashimoto, and Makoto Mori, all of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation-in-part of Ser. No. 343,260, Jan. 27, 1982, abandoned. This application Jul. 21, 1984, Ser. No. 515,680
Claims priority, application Japan, Jan. 27, 1981, 56-10569
Int. Cl.³ H02H *3/26*
U.S. Cl. 361—86 **4 Claims**



1. A protection circuit for an output transistor having a base electrode, an emitter electrode, and a collector electrode, comprising:

a first terminal coupled to the collector electrode of said output transistor;

a second terminal coupled to the emitter electrode of said output terminal;

a first transistor having a base electrode, an emitter electrode and a collector electrode;

first means for connecting the base electrode of said first transistor to the base electrode of said output transistor;

first resistor means coupled between said emitter electrode and said second terminal for reducing a collector current of said first transistor;

second means comprising first diode means and second resistor means for connecting said collector electrode of said first transistor to said first terminal for producing a voltage being equal to the base to emitter voltage of said output transistor;

a second transistor having a base electrode, an emitter electrode and a collector electrode;

third means for connecting the base electrode of said second transistor to the collector electrode of said first transistor;

fourth means for connecting the collector electrode of said second transistor to said first terminal;

third resistor means coupled between said emitter electrode of said second transistor and said second terminal;

a fourth transistor having a base electrode, an emitter electrode and a collector electrode;

fifth means for connecting the base electrode of said fourth transistor to the emitter electrode of said third transistor; and

second diode means coupled between said emitter electrode of said third transistor and said first terminal, thereby

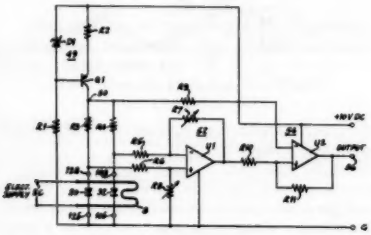
producing a protecting signal from the collector electrode of said third transistor.

4,538,199

ELECTROTHERMAL WIRE RESPONSIVE MINIATURE PRECISION CURRENT SENSOR

Ralph F. Bielinski, So. Milwaukee, Wis.; M. Frank Chacon, Athens, Ala.; Dennis M. Kramer, Brookfield; William R. Mathias, Cedarburg, both of Wis., and Stanley Schneider, Broomall, Pa., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jul. 14, 1983, Ser. No. 513,570
Int. Cl.³ H02H *5/04*
U.S. Cl. 361—93 **14 Claims**



1. An overcurrent protection system for an electrical supply circuit comprising:

a fast response current sensor comprising:

electrothermal menas for generating heat as a function of the value of current in said supply circuit;

means comprising a first PN junction semiconductor sensor device for sensing ambient temperature and providing a first control signal in proportion thereto;

means comprising a second PN junction semiconductor sensor device for sensing the temperature of said heat generating electrothermal means and providing a second control signal in proportion thereto;

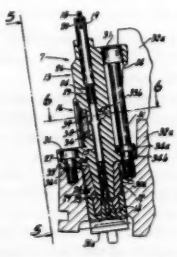
and differential means responsive to said first and second control signals, including means for adjusting the same for a predetermined output value at ambient temperature, for providing an electrical operating signal proportional to the differential of said first and second control signals indicative of the current in said supply circuit.

4,538,200

POWER CONNECTION APPARATUS HAVING INTEGRATED SURGE ARRESTOR

Maqboolhusein G. Shaikh, Troy, Ohio, assignor to A. O. Smith Corp., Milwaukee, Wis.

Filed Mar. 17, 1983, Ser. No. 476,115
Int. Cl.³ H02H *3/22*
U.S. Cl. 361—117 **13 Claims**



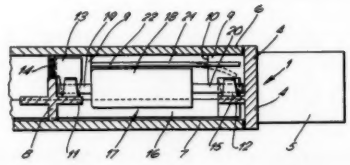
1. A power line unit having a least two power leads, an insulating shell encasing said power leads, said shell including a sidewall arrestor opening exposing said power leads, an arrestor unit secured within said opening to form an exterior exposed wall and secured to the edges of said opening to close said opening and including an arrestor block within said opening in opposed operative relation to said exposed leads, and said arrestor unit having a ground connection secured to said arrestor block.

4,538,201

SURGE PROTECTOR

Oscar Wuyts, Beveren-Waas; Remy F. Ruelens, Edegem, and Lucien J. M. Van Camp, Zandhoven, all of Belgium, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Apr. 6, 1984, Ser. No. 597,774
Claims priority, application Belgium, May 2, 1983, 60084
Int. Cl.³ H02M *1/04*
U.S. Cl. 361—124 **9 Claims**



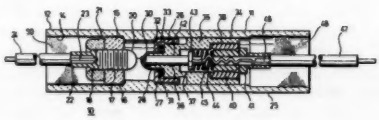
1. Surge protector with first and second electrodes, with a heat sensitive means and with a contact member which is electrically connected with said first electrode and which is mounted so as to be abruptly brought into contact with said second electrode upon the temperature of said heat sensitive means reaching a predetermined value when receiving heat from said protector, wherein said heat sensitive means is comprised of a material whose shape is a function of its temperature, wherein said protector forms part of an assembly including a plurality of such protectors whose first electrodes are electrically interconnected, and wherein said contact members of said plurality of protectors, which are mounted adjacent one another, form part of a common contact plate electrically and thermally connected to the bodies of said protectors.

4,538,202

CURRENT TRANSFORMER SECONDARY VOLTAGE LIMITER

Donald K. Ferguson, Peterborough, Canada, assignor to Canadian General Electric Company Limited, Toronto, Canada

Filed Feb. 23, 1984, Ser. No. 582,812
Claims priority, application Canada, May 27, 1983, 429079
Int. Cl.³ H02H *1/00*; H01H *61/00*
U.S. Cl. 361—124 **13 Claims**



1. A protective device for protecting an apparatus, against destructive overvoltages comprising,

a tubular casing of insulating material,

a stud support mounted within said casing at a first end thereof,

a conductive stud mounted on said stud support, the inner end thereof forming an arcing surface,

a support member mounted within said casing at a second end opposite said first end,

a conductive plunger mounted in said support member for longitudinal sliding movement between a first position engaging said arcing surface of said stud and a second position spaced from said arcing surface of said stud,

a fusible element mounted to the inner end of said support member forming an arcing surface and engaging the inner end of said plunger retaining it in said second position,

spring means engaging said plunger and biasing said plunger against said fusible element and towards said first position,

means for adjusting the spacing between the arcing surface on said stud and the arcing surface formed by said fusible element, and

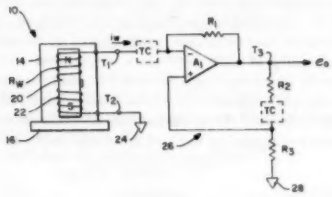
terminal means on the outer end of said stud and connected to said plunger for connection of said device to an apparatus to be protected whereby an overvoltage will cause an arc discharge between said arcing surface and an arc energy of sufficient level will fuse said fusible element permitting movement of said plunger to said first position shorting the apparatus.

4,538,203

PASSIVE MASS-SPRING TYPE OF SENSING DEVICE HAVING ELECTRONIC DAMPING

Philip D. Flanner, Pleasant Hill; Harold D. Morris, Orinda, and Gerald R. Newell, Concord, all of Calif., assignors to Systron Donner Corp., Concord, Calif.

Filed Apr. 11, 1983, Ser. No. 483,584
Int. Cl.³ H01H *47/00*
U.S. Cl. 361—159 **19 Claims**



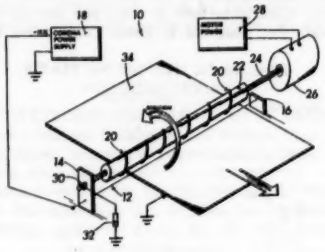
1. In a device including means for producing a magnetic field and a single electrically conductive coil having a given impedance disposed within said magnetic field in a way which results in relative movement between the coil and field corresponding to a particular parameter being monitored whereby to produce a voltage signal which also corresponds to said parameter, a circuit arrangement for damping said relative movement, comprising means connected with said coil for providing a closed electrical circuit including the coil such that the relative velocity between the coil and field as a result of said movement causes a current to be produced in said circuit including said single coil and to flow through said single coil in a way which produces a force, proportionate in magnitude to said current, opposing said movement whereby to dampen said movement, said circuit providing means also including mean for maintaining said voltage signal at a measurable value while, at the same time, reducing the total effective impedance of said closed circuit including said single coil below the given impedance of said coil whereby to increase the magnitude of said current and therefore its associated damping force to a greater value than would be possible merely by shorting together the ends of the coil.

4,538,204

CORONA PRODUCING METHOD AND APPARATUS

Harold J. Weber, Sherborn, Mass., assignor to Coulter Systems Corporation, Bedford, Mass.

Filed Feb. 16, 1982, Ser. No. 348,762
Int. Cl.³ H01T *19/00*
U.S. Cl. 361—229 **13 Claims**



1. Apparatus for producing a substantially uniform elongate corona discharge comprising:

A. at least one stationary elongate corona electrode;

B. elongate ground electrode having a series of equally-spaced grounding points disposed along an axis parallel to said stationary elongate corona electrode at a predetermined distance therefrom;

C. means for moving said grounding points along said axis; and

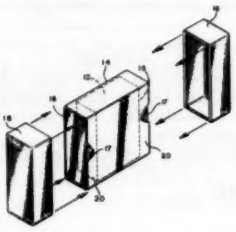
D. source of corona power coupled to said stationary elongate corona electrode.

4,538,205

MEANS AND METHOD FOR FABRICATING PLANAR TERMINATED CAPACITORS

Bernard Lavene, Ocean, N.J., assignor to Electronic Concepts, Inc., Eatontown, N.J.

Continuation-in-part of Ser. No. 348,401, Feb., 1982, Pat. No. 4,455,591. This application Mar. 5, 1984, Ser. No. 586,014
Int. Cl.³ H01G *1/13;* H01L *21/64*
U.S. Cl. 361—308 **9 Claims**



1. A planar terminated capacitor comprising:

(a) a capacitor element having first and second terminals at opposite ends thereof;

(b) a non-conductive sleeve surrounding said capacitor element with the ends of said sleeve extending outwardly substantially beyond said first and second terminals forming first and second cavities;

(c) a conductive substance substantially filling and sealing the cavities and engaging and electrically coupled to the terminals; and

(d) first and second metal end caps individually positioned at opposite ends of the sleeve distant from the terminals and substantially enclosing the first and second cavities and

engaging and electrically coupled to the conductive substance, the first and second end caps being electrically coupled to the first and second terminals respectively only through the conductive substance but free of direct engagement with the first and second terminals.

4,538,206

DIELECTRIC FLUID FOR A CAPACITOR

Vandos Shedigian, Indianapolis, Ind., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Filed May 31, 1984, Ser. No. 615,562
Int. Cl.³ H01G *4/22*
U.S. Cl. 361—315 **3 Claims**

1. In a metallized polypropylene film capacitor, a dielectric fluid consisting of a cycloaliphatic epoxide.

4,538,207

DIELECTRIC FLUID FOR A CAPACITOR

Vandos Shedigian, Indianapolis, Ind., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Filed Mar. 29, 1984, Ser. No. 594,877
Int. Cl.³ H01G *4/22*
U.S. Cl. 361—317 **4 Claims**

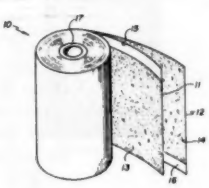
1. In a paper, paper-film capacitor, a dielectric fluid including a mixture of dioctyl phthalate and branched alkylated benzene with 18 carbons outside the benzene ring.

4,538,208

ALTERNATING CURRENT CAPACITOR

Vandos Shedigian, Indianapolis, Ind., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Continuation-in-part of Ser. No. 538,090, Oct. 3, 1983, abandoned, which is a continuation of Ser. No. 336,722, Jan. 4, 1982, abandoned, which is a continuation-in-part of Ser. No. 189,126, Sep. 22, 1980, abandoned. This application May 21, 1984, Ser. No. 612,554
Int. Cl.³ H01G *4/22*
U.S. Cl. 361—319 **7 Claims**



1. In an alternating current capacitor of the type having a housing enclosing a pair of convolutely wound electrodes, a dielectric including soybean oil and dielectric spacer means interleaved therebetween for separating said electrodes, with at least one of said electrodes being formed by a metallized film, a method of reducing the mobility of said dielectric and maintaining same in proximity to said electrodes which comprises adding a minor amount of an alkylhydroxyphenylalkanolyhydrazine compound to provide a gel of said soybean oil within said housing.

4,538,209

DOUBLE FILE PRINTED WIRING BOARD MODULE

William A. Reimer, Wheaton, Ill., assignor to GTE Automatic Electric Incorporated, Northlake, Ill.

Filed Aug. 29, 1983, Ser. No. 527,634
Int. Cl.³ H05K *1/14*
U.S. Cl. 361—395 **14 Claims**

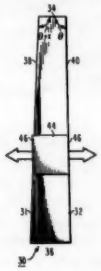
1. A double file printed wiring board module comprising:

first and second columns of printed wiring boards, each column including at least one printed wiring board, each board including a component mounting surface, first and second edges, and a plurality of connector tabs adjacent to said first edge to provide access to said board, said board in said first column arranged parallel to said board in said second column without overlap in a direction normal to said component mounting surfaces, said connector tab edge of said board in said first column adjacent to said connector tab edge of said board in said second column;

a pair of support plates, each support plate positioned adjacent to a different one of said board second edges;

a plurality of positioners positioning said support plates relative to each other;

at least one pair of printed wiring board guides, each guide attached to a different one of said support plates and including at least one groove engaged with a corresponding one of said board second edges;



at least first and second interconnected connectors, each connector engaging said plurality of connector tabs of a different one of said printed wiring boards;

a side plane positioned relative to said support plates, positioned intermediate to said printed wiring boards, mounting said first connector on a first side thereof and said second connector on a second side thereof not opposite said first connector, said side plane via said connectors cooperating with said support plates via said board guides to support said printed wiring boards;

an inner plane formed in said side plane intermediate said first and said second side surfaces; and

a plurality of printed wiring conductors formed on said first side surface, on said second surface and on said inner plane, said printed wiring conductors connected in a predetermined manner to said connectors to provide signal paths between said first and second interconnected connectors.

4,538,210

MOUNTING AND CONTACTING ASSEMBLY FOR PLATE-SHAPED ELECTRICAL DEVICE

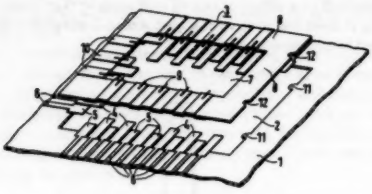
Werner Schaller, Lampertheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 29, 1983, Ser. No. 479,996
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1982, 3213884
Int. Cl.³ H05K *1/16*
U.S. Cl. 361—401 **24 Claims**

1. In a mount in the form of a circuit board for holding an electrical device comprising a plate member with a periphery bearing a multiplicity of electrical contacts in a predetermined array, said circuit board having a window larger than said plate member for receiving same, said circuit board being provided with conductor runs and connection means for operatively linking said conductor runs to respective electrical contacts of said plate member, the improvement comprising:

a multiplicity of elastically resilient holding tabs attached to the circuit board, at least some of said holding tabs being operatively connected to respective conductor runs of said circuit board, said holding tabs including respective

tab portions projecting into said window in a disposition corresponding at least in part to the array of electrical contacts on the periphery of the plate member, the connection means including at least some of said holding tabs, said window having approximately the same size and shape as said plate member, said plate member having a first side and a second side facing opposite thereto, said tab portions including short tab portions having a first length and long tab portions having a second length greater than said first length, said lengths differing by a sufficiently



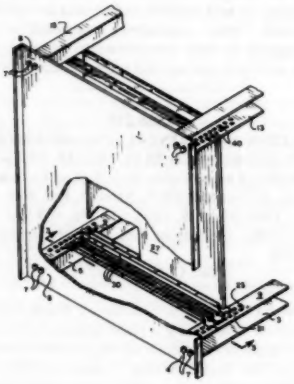
great amount and said holding tabs being sufficiently resilient so that, upon an engagement of said tab portions with said first side of said plate member and a motion thereof through said window, all of said tab portions initially bend in the direction of motion of said plate member and said short tab portions subsequently snap back in a direction opposite said motion of said plate member, said short tab portions engaging said second side and said long tab portions engaging said first side of said plate member upon a mounting thereof in said window.

4,538,211

PRINTED WIRING BOARD FILE WITH VARIABLE PRINTED WIRING BOARD SPACINGS

Ansano Bertellotti, Addison, and Anthony Traina, Villa Park, both of Ill., assignors to GTE Communication Systems Corporation, Northlake, Ill.

Filed Aug. 13, 1984, Ser. No. 639,881
Int. Cl.³ H05K *1/14*
U.S. Cl. 361—415 **11 Claims**



1. A file for a printed wiring board employing printed wiring board guides positionable within said file, said file comprising:

first and second end panels;

at least first and second support members, each attached to said first and said second end panels, and each including a row of first indexing means, each of said first indexing means spaced apart a predetermined distance from adjacent ones of said first indexing means,

a row of second indexing means, each of said second indexing means spaced a predetermined distance from adjacent ones of said second indexing means, said rows parallel to each other with said second indexing means displaced laterally relative to said first indexing means;

at least first and second printed wiring board guides, each including first and second engaging means, said first engaging means of said first guide engaging only a predetermined one of said first indexing means of said first support member, and said second engaging means of said first guide engaging only a corresponding first indexing means of said second support member, said first engaging means of said second guide engaging only a predetermined one of said second indexing means of said first support member, and said second engaging means of said second guide engaging only a corresponding second indexing means of said second support member;

whereby said first and second board guides are positioned within said file and spaced a predetermined distance from each other, said spacing being an alternative to that available if said engaging means of both of said guides are engaged, only with selected ones of said first indexing means or alternately, both of said guides are engaged only with selected ones of said second indexing means

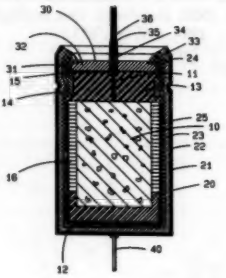
---

4,538,212

ELECTROLYTIC CAPACITOR

William P. Montgomery, Pownal, Vt., assignor to Sprague Electric Company, North Adams, Mass.

Filed Jul. 30, 1984, Ser. No. 635,972
Int. Cl.³ H01G *9/00*
U.S. Cl. 361—433 **8 Claims**



1. In an electrolytic capacitor having a porous anodized valve-metal pellet anode, a hermetic glass-metal seal having a metal ring forming its periphery and a housing in the form of a can, the improvement comprises a thin layer of a ductile and solderable metal on the inner surface of the mouth of said can which extends into said can at most as far as the bottom of said seal.

4,538,213

VEHICLE HEADLIGHT ATTACHMENT

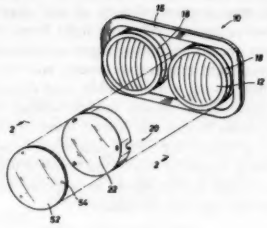
Jessie A. Martin, 15442 Linkshire, Houston, Tex. 77062

Continuation of Ser. No. 236,771, Feb. 23, 1981, abandoned, which is a continuation-in-part of Ser. No. 130,751, Mar. 31, 1980, abandoned. This application Mar. 7, 1984, Ser. No. 587,230
Int. Cl.³ B60Q *1/00*
U.S. Cl. 362—61 **7 Claims**

1. A detachable lens attachment for vehicle headlights having a substantially smooth headlight rim, comprising:

(a) a transparent surface having a diameter corresponding to the diameter of the headlight;

(b) an upstanding circumferential rim extending outwardly from said surface and located about the peripheral edge thereof having continuously, unbroken portions; and



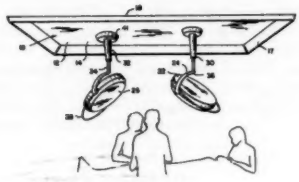
(c) a plurality of beads formed on the interior surface of said continuously, unbroken portions of said rim, said beads adapted to form a friction fit with the substantially smooth headlight rim.

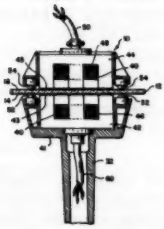
4,538,214

MAGNETICALLY SUPPORTED SURGICAL LIGHT

Kenneth J. Fisher, and William R. Miller, both of Erie, Pa., assignors to American Sterilizer Company, Erie, Pa.

Filed Dec. 29, 1983, Ser. No. 566,580
Int. Cl.³ F21S *1/02*
U.S. Cl. 362—147 **18 Claims**





1. An illumination system suspended from a continuous panel having an exposed surface and a concealed surface for use with a conventional power source comprising:

at least one light source suspended from the panel;

at least one split-core transformer for creating a magnetic field for transferring electrical energy through the panel to said light source, each said transformer adapted for sliding motion over the exposed and concealed surfaces while maintaining said transfer of electrical energy, each said transformer having two halves, one of said halves disposed on the concealed surface and connected to the power source and the other of said halves disposed on the exposed surface and connected to said light source; and

each of said halves comprising electroinductive coils enclosed in permanent magnets,

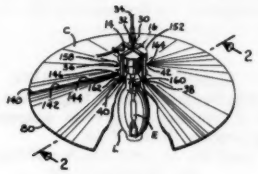
each of said magnets having rollers on which said magnet can slide over the one of the surfaces on which said magnet is disposed.

4,538,215

HALIDE AND LIKE LIGHT REFLECTOR AND SOCKET ASSEMBLY

Melvin J. De Marsh, 4306 SW. Juneau St., #11, Seattle, Wash. 98136

Division of Ser. No. 299,673, Sep. 8, 1981, Pat. No. 4,418,379. This application Nov. 17, 1983, Ser. No. 552,698
The portion of the term of this patent subsequent to Dec. 29, 2000, has been disclaimed.
Int. Cl.³ F21V *7/00*
U.S. Cl. 362—282 **7 Claims**



7. A lighting assembly especially adapted to enhance use thereof for effectively illuminating growing plants in a greenhouse or the like, said assembly comprising:

a conically shaped reflector in the form of a simple frustocone with the lower, concavical, reflecting surface thereof arranged at a uniform cone angle of about 76°–64° with respect to the center axis of the cone, said cone having a central opening about four inches in diameter, said cone being fabricated of nominally planar sheet metal stock, with a small segment cut therefrom along cuts extending generally radially of the cone, the radial cuts being joined generally adjacent the edges thereof to provide the conical configuration of the reflector;

a lamp socket mounted coaxially of and slightly above the central opening of the cone, and in open, spaced relation thereto for air circulation therebetween;

means attached to said socket by which the assembly can be hung or otherwise supported in a depending manner from overhead structure; and

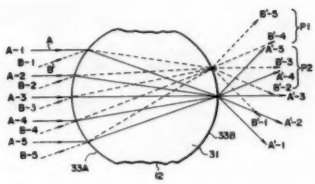
a high powered halide light mounted in said socket in part extending substantially below the plane of the outer edge of the conically shaped reflector.

4,538,216

LIGHTING APPARATUS

Leo Mori; Mamoru Tominaga, both of Yokohama, and Takashi Aoba, Ageo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 21, 1982, Ser. No. 400,477
Claims priority, application Japan, Jul. 28, 1981, 56-118191
Int. Cl.³ F21V *3/00*
U.S. Cl. 362—311 **12 Claims**



1. A lighting apparatus having a first light transmitting-cover through which light rays are projected, said first light transmitting-cover comprising:

a plate of light transmitting-material having a first and second surfaces;

a plurality of first segment lens elements of a same size and

a same shape, integrally formed with the plate and arranged on the first surface of the plate; and

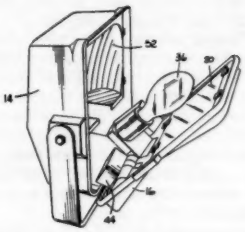
a plurality of second segment lens elements of a same size and a same shape, integrally formed with the plate and arranged on the second surface of the plate in face-to-face relation with the plurality of first segment lens elements, respectively, thereby forming a plurality of segment lenses, wherein the first and second segment lens elements of each pair have a common optical axis and convex surfaces and have substantially equal focal lengths so that a focal point of the first segment lens element lies on a convex surface of the second segment lens element and a focal point of the second segment lens element lies on a convex surface of the first segment lens element.

4,538,217

FLOODLIGHT LUMINAIRE

Robert L. Ewing, Newark; James S. Hughes, and Bruce Bruggeman, both of Columbus, all of Ohio, assignors to Manville Service Corporation, Denver, Colo.

Filed Sep. 16, 1983, Ser. No. 533,322
Int. Cl.³ F21V *17/00*
U.S. Cl. 362—375 **3 Claims**



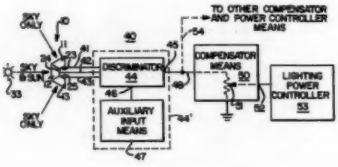
1. A luminaire comprising a housing, a luminaire door, pivotedly and detachably mounted on said housing, a reflector fixedly attached in the interior of said housing; a lamp socket and lamp mounted on said luminaire door, and electrical components of said luminaire mounted on said luminaire door below said lamp socket; an opening in said luminaire door with a lens covering said opening.

4,538,218

SKYLIGHT SENSOR AND CONTROL SYSTEM

Francis M. Watson, York, Canada, assignor to Honeywell Ltd., Canada

Filed Nov. 3, 1983, Ser. No. 548,522
Claims priority, application Canada, May 20, 1983, 428593
Int. Cl.³ F21S *11/00*
U.S. Cl. 362—802 **15 Claims**



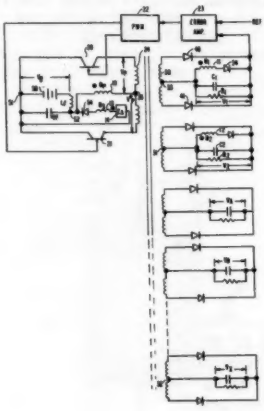
1. A skylight sensor and control system for the control of the interior illumination of an area having fenestration means and controllable artificial light source means, including: light sensor means having an active area adapted to be mounted so as to expose said active area to the exterior of said fenestration means; said light sensor means including a plurality of adjacent segments with said segments shielded from each other so that each of said segments form light gathering means; a front portion for each of said segments and a corresponding rear portion for each of said segments; said front portion of each of said segments exposed to the exterior of said fenestration means; said rear portion of each of said segments including light responsive means collecting light from said active area; discriminator means including input connection means connected to said light responsive means, and said discriminator means further having output means; said discriminator means providing said output means with a voltage from the light responsive means having the lowest level of illumination; and lighting power controller means adapted to control said artificial light source means to lower the level of illumination from said artificial light source means in response to an increase in the light at said light sensor means.

4,538,219

MULTIWINDING INDUCTOR AND ASSOCIATED APPARATUS

David Morris, Woodbridge, and Albrecht Schwarz, North Caldwell, both of N.J., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jul. 15, 1983, Ser. No. 514,138
Int. Cl.³ H02M *3/335*
U.S. Cl. 363—26 **19 Claims**



1. In a power control circuit, said power control circuit of the type employing a transformer having a primary winding with a center tap and at least three secondary windings, said primary winding having first and second terminals coupled to switching devices for selectively controlling the power applied to said winding during a first free wheeling mode when both switching device are off and during a second power stroke mode when at least one switching device is on with the on time plus the off time equal to the period of said circuit, said switching devices having an input terminal adapted to be coupled to a source of power to be controlled, the combination therewith of an improved multiwinding inductor, said inductor comprising:

a first winding (N_P) having one terminal coupled to said center tap of said primary winding and a second terminal adapted to be coupled to said power source a second winding (N_3) having one terminal coupled through a rectifier to said second terminal of said first winding and a second terminal of said second winding coupled through an auxiliary impedance to said input terminal of said switching devices, a third winding (N_1) of said inductor coupled to a first one of said secondary windings of said transformer, and a fourth winding (N_2) of said inductor

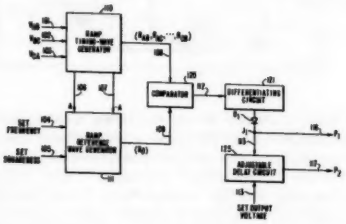
coupled to a second one of said secondary windings of said transformer, whereby said third secondary winding has no winding associated with said inductor with said second winding of said inductor and said auxiliary impedance operative to transfer back stored energy in said circuit to said power source during said free wheeling mode.

4,538,220

ADJUSTABLE FREQUENCY AC MOTOR DRIVE USING AN UNRESTRICTED FREQUENCY CHANGER SYSTEM

Laszlo Gyugyi, Penn Hills Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 3, 1983, Ser. No. 548,546
Int. Cl.[3] H02M *5/27*
U.S. Cl. 363—161 **6 Claims**



6. An unrestricted frequency changer (UFC) controlled by a train of control pulses having a rate selectable in relation to frequency, said rate being increased beyond a predetermined operating frequency of the UFC during selected initial and final portions of a half cycle of the output AC power supply of the UFC, and said rate being at the natural commutation rate of the input AC power supply of the UFC during the intermediate portion thereof, whereby at higher operating frequency the UFC delivers a trapezoid-like waveform.

4,538,221

APPARATUS AND METHOD FOR MIXING A PLURALITY OF SUBSTANCES

Stephen F. Crain; Steven H. Gray; Edward P. Arnold, and Timothy J. Dodd, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Apr. 6, 1983, Ser. No. 483,001
Int. Cl.[3] G06F *15/46;* G05D *11/13*
U.S. Cl. 364—172 **10 Claims**

1. An apparatus for controlling the addition of a substance to a primary flow, comprising:

conduit means for providing a path for said primary flow;

additive means for flowing said substance into said conduit means;

First detector means for detecting a rate of said primary flow;

second detector means for detecting a rate of said substance when said additive means flows said substance into said conduit means, said second detector means including:

speed detector means for detecting a speed rate at which said additive means is operating; and

flow detector means for detecting a flow rate of said substance; and

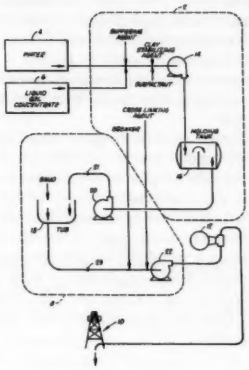
control means, responsive to said first detector means and said second detector means, for controlling said additive means, said control means including a unified control panel comprising:

a channel control sector including:

first data entry means for manually entering a first data number specifying a first magnitude of an additive substance flow rate determining parameter for use by said control means in controlling said additive means;

second date entry means for manually entering a second data number specifying a second magnitude of said additive substance flow rate determining parameter for use by said control means in controlling said additive means; and

means for directing said control means to use either said



speed rate or said flow rate for controlling said additive means; and

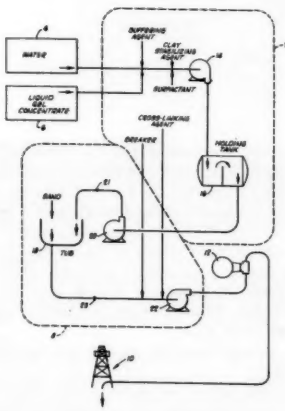
means for selectably directing said control means to utilize either said first data number or said second data number in controlling said additive means.

4,538,222

APPARATUS AND METHOD FOR MIXING A PLURALITY OF SUBSTANCES

Stephen F. Crain; Steven H. Gray; Michael L. Green, all of Duncan, Okla., and Ronald A. Gibson, Camarillo, Calif., assignors to Halliburton Company, Duncan, Okla.

Filed Apr. 6, 1983, Ser. No. 483,031
Int. Cl.[3] G06F *15/46;* G05D *11/13*
U.S. Cl. 364—172 **14 Claims**



1. An apparatus for controlling the mixing of a plurality of substances, comprising:

portable support means for being transported;

a holding tank mounted on said support means;

first container means, mounted on said support means, for holding a first additive;

second container means, mounted on said support means, for holding a second additive;

inlet conduit means, mounted on said support means, for providing a flow path to said holding tank;

outlet conduit means, mounted on said support means, for providing a flow path from said holding tank;

first connector means, mounted on said support means, for providing a flow path from said first container means to said inlet conduit means;

second connector means, mounted on said support means, for providing a flow path from said second container means; and

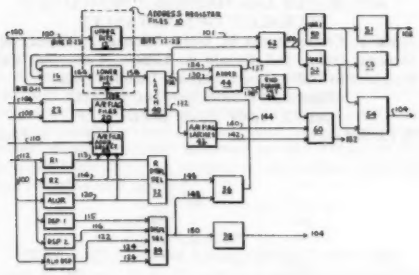
control means, for controlling, in response to a flow along said inlet conduit means, the flow of said first additive from said first container means into said inlet conduit means so that a selectable amount of said first additive is added to a fluid flowing through said inlet conduit means to define a reactable mixture flowed into said holding tank, and for controlling, in response to a flow along said outlet conduit means occurring at a time after said mixture has reacted in said holding tank, the flow of said second additive from said second container means into the reacted mixture.

4,538,223

COMPUTER OPERAND ADDRESS COMPUTATION

Richard Vahlstrom, Villa Park, and Dennis R. Keats, Irvine, both of Calif., assignors to Microdata Corporation, Irvine, Calif.

Filed Sep. 29, 1982, Ser. No. 427,830
Int. Cl.³ G06F *9/36*
U.S. Cl. 364—200 **5 Claims**



1. An address computation (ADC) system for use in a computer system for determining an absolute main memory address of an operand stored in main memory wherein the initial address of the operand is defined in terms of a base address, a displacement from the base address and a constant comprising:

initial address input means to supply the ADC with the initial address originating from a direct software instruction from the computer system arithmetic logic unit (ALU) and a firmware word latched onto an instruction register in the ALU;

address register means for storing the base address of the operand;

displacement register means for storing the initial displacement for the operand received from the firmware word;

adder means for combining the constant received from the firmware word and the displacement with the base address to produce the absolute main memory address; and

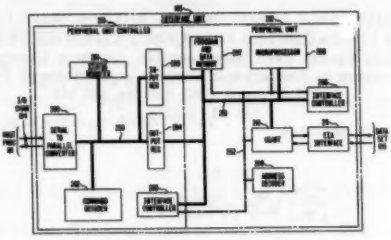
output means to supply the absolute main memory address to memory address bus means in the computer system via at least one of two separate, selectable hardware address registers.

4,538,224

DIRECT MEMORY ACCESS PERIPHERAL UNIT CONTROLLER

Thomas A. Peterson, Naperville, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 30, 1982, Ser. No. 428,681
Int. Cl.³ G06F *9/24, 3/00*
U.S. Cl. 364—200 **20 Claims**



1. A direct memory access peripheral unit controller for loading a peripheral unit program received from a host processor into a peripheral unit; said peripheral unit having a random access memory, a peripheral processor, a data bus, and an address bus; said data and address buses interconnecting said memory and said peripheral processor; said memory having a data portion addressable with a data address for storing data and a program portion addressable with a program address for storing said program; said peripheral processor being responsive to said program for transferring data between said host processor and said data portion of said memory on said data bus; said direct memory access peripheral unit controller comprising:

buffer means for transferring information including a controller address, said program address, and said program received from said host processor onto said data bus;

direct memory access controller means having a controller location addressable with said controller address received from said address bus to store said program address received from said host processor on said data bus for addressing said program portion with said program address on said address bus; and

host processor access means for transferring to said address bus said controller address received from said host processor on said data bus.

4,538,225

TABLE-DRIVEN APPARATUS FOR DATA DISPLAY AND MODIFICATION

Edwin R. Banks, 1208 Country Ct., Cary, N.C. 27511; Roger C. Ray, SW. 9320 Royal Woodlands, Beaverton, Oreg. 97005, and Paul B. Dale, 210 Old Westboro Rd., North Grafton, Mass. 01536

Filed Mar. 15, 1982, Ser. No. 358,509
Int. Cl.³ G06F *3/023, 3/14, 9/00*
U.S. Cl. 364—200 **36 Claims**

1. In a data processing system, editing means for modifying data codes comprising:

(1) receiving means for receiving input codes in said editing means;

(2) memory means including

(a) buffer memory means for storing said data codes,

(b) control data memory means for storing at least state data specifying the state of said editing means, and

(c) editing table memory means for storing an editing table including

(i) editing instruction sequences corresponding to said input codes for specifying editing operations modifying said data codes in said buffer memory means, and

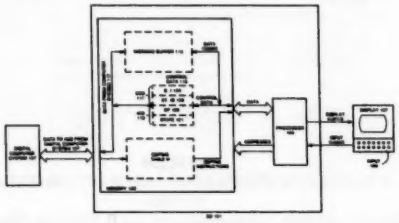
(ii) a plurality of sections containing said editing instruc-

tion sequences, each said section corresponding to one value of said state data; and

(3) processing means connected to said receiving means and said memory means including

(a) means for receiving said input codes from said receiving means,

(b) for each said input code and one said value of said state data, means for determining the location of said corresponding said section corresponding to said one said value



and means for determining the location of said editing instruction sequence corresponding to said input code in said corresponding said section,

(c) means for receiving said editing instructions of said corresponding said editing instruction sequence, and

(d) means for responding to said editing instructions of said corresponding said editing instruction sequence by modifying said data codes in said buffer memory means,

whereby said data codes are modified by said processing means in response to said input codes.

4,538,226

BUFFER CONTROL SYSTEM

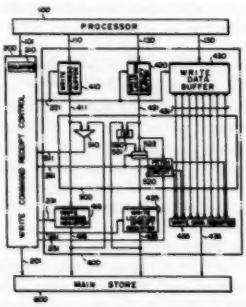
Kiyoshi Hori, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jan. 25, 1984, Ser. No. 573,745

Claims priority, application Japan, Jan. 27, 1983, 58-11841

Int. Cl.³ G06F *13/00*

U.S. Cl. 364—200 **4 Claims**



1. A buffer control apparatus for controlling delivery of data from a processing unit equipped with a buffer device to a main store, comprising:

write command request means for generating a write command request signal, a write address signal, a write data signal and a write location specify signal;

store means for storing the write address signal, the write data signal and the write location specify signal which are supplied thereto from said write command request means;

counter means for responding to the write command request signal from the write command request means by incrementing at a predetermined time interval;

command signal generator means for generating a command signal when said counter means reaches a predetermined value;

comparator means for comparing a last write address stored in the store means before the command signal generator means generates the command signal and an address of a subsequent request;

merging means for writing subsequent write data over preceding write data stored in the store means in response to a coincidence output of the comparator means and according to a write command by a subsequent request having a write address which is coincident with the last write address; and

data read command means for delivering a command for reading data out of the store means in response to the command signal from the command signal generator means.

4,538,227

MEDICAL IMAGE PROCESSOR

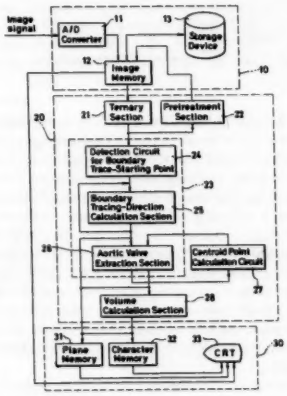
Kazuo Toraichi, Sayama; Nobuyuki Otsu, Yatabemachi, and Motomu Suzuki, Ohtawara, all of Japan, assignors to Agency of Industrial Science and Technology and Ministry of International Trade and Industry, both of Tokyo, Japan

Filed Sep. 30, 1982, Ser. No. 431,384

Claims priority, application Japan, Oct. 5, 1981, 56-157410

Int. Cl.³ G06F *15/42*

U.S. Cl. 364—414 **12 Claims**



1. An image processor comprising:

an image input circuit including an analog-to-digital converter for converting a provided gray-level image into a quantized image signal, and an image memory for successively storing an image on the basis of the quantized image signal from the analog-to-digital converter;

an image processing circuit including,

a ternary circuit for producing a ternary code signal based on the quantized signals outputted from the image memory in said image input circuit on the basis of a gray-level histogram,

a boundary extraction means for extracting a boundary of a measured part within the image to be processed on the basis of the ternary code signal from said ternary circuit and for producing a corresponding boundary signal,

a volume calculation means for integrating the boundary signal from said boundary extraction means and the value of gray-level within said boundary to produce a volume signal corresponding to the volume of the measured part, and

a centroid operation means for obtaining the centroid of the measured part on the basis of the volume signal from said

boundary extraction means and for producing a corresponding centroid signal; and

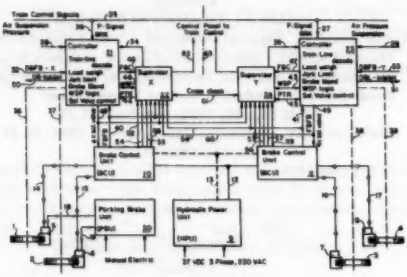
an output circuit including a plane memory for storing at least selected of the signals produced by said image processing circuit and a display device for displaying images corresponding to at least selected of the signals stored in said plane memory.

4,538,228

HYDRAULIC PRESSURE ACTUATED BRAKE SYSTEM FOR RAIL VEHICLES

Nicholas J. Brearey, and Rolf Baumgarth, both of Gaithersburg, Md., assignors to Knorr-Bremse GmbH, Munich, Fed. Rep. of Germany

Filed Sep. 29, 1982, Ser. No. 427,385
Int. Cl.[3] B60T *13/68*; G06F *15/20*
U.S. Cl. 364—426 **31 Claims**



19. A brake system for a vehicle comprising:

a plurality of brake actuators for engaging the brakes of said vehicle, said brake actuators applying a braking force to said brakes in response to an applied fluid pressure;

means for applying a pressure to said brake actuators including a plurality of valve means, each valve means connected to control the pressure to a pair of actuators, and responsive to a plurality of electrical signals for individually controlling the pressure to a pair of actuators;

a plurality of pressure sensitive transducers for measuring the fluid pressure applied to each pair of brake actuators;

a pressure switch associated with each of said valve means having a predetermined pressure threshold for a switching state;

a control unit connected to receive signals from said transducers, and pressure switches, and to receive a plurality of brake operating parameters including a demand pressure command, said control unit providing a first set of actuating electrical signals to said valve means to provide a closed loop brake system at a pressure setting indicated by said demand pressure, said control unit including:

a first memory, and means for writing representative values of fluid pressure and valve means settings for a plurality of demand pressure settings during closed loop operation of said brake system in said first memory, and, a second memory for storing said predetermined pressure switch threshold;

means for detecting a fault in said brake system from said transducer signals, said means connected to disable said closed loop operation;

means for detecting the state of said pressure switches when a fault is detected;

means for establishing an initial open loop fluid pressure on said brake actuators, said initial pressure being determined in response to a comparison of the state of said pressure switch and a stored predetermined pressure level, said initial open loop pressure being selected in a direction to change the state of said pressure switch;

means for reading out of said first memory valve means setting data for obtaining a pressure setting indicated by a subsequently received demand pressure command; and

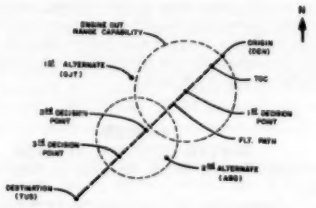
means for providing a second set of actuating electrical signals to said valve means in response to said read out valve means setting data whereby said valve means are first operated in an open loop mode with said predetermined pressure level, and then with fluid pressure determined in response to earlier stored closed loop data from said transducers selected in response to a pressure demand signal.

4,538,229

SYSTEM FOR PREPARING AIRCRAFT DRIFTDOWN PLANS

Karen L. Baltzer, Minneapolis, and Jan B. Peterson, Burnsville, both of Minn., assignors to Kavouras, Inc., Minneapolis, Minn.

Filed Mar. 10, 1983, Ser. No. 474,149
Int. Cl.[3] G06F *15/50*
U.S. Cl. 364—428 **4 Claims**



1. A method for preparing driftdown plans for aircraft, comprising the steps of:

(a) developing a first data base defining the height above sea level of terrain at predetermined geographic coordinate locations;

(b) storing said first data base in the memory of a digital computer, each height value entry in said data base being at a predetermined addressable location in said memory;

(c) developing a second data base defining driftdown flight performance characteristics of a variety of multi-engine aircrafts upon the loss of power of at least one of said engines for a variety of engine types;

(d) storing said second data base in said memory of said digital computer;

(e) entering flight specification data, including the type of aircraft, the type of engine on said aircraft, the load factor of the aircraft and the geographic location of a flight origin and a flight destination for a proposed route into said computer;

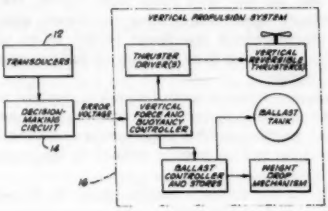
(f) executing a program of instructions in said computer for comparing terrain height information in said first data base related to the routing of the aircraft between said origin and said destination to driftdown altitude in said flight performance characteristics along said proposed route in said second data base; and

(g) providing a visual manifestation based on the result of the comparison of alternate landing sites which the aircraft would be capable of reaching, while maintaining a predetermined safe clearance distance above the terrain, in the event the loss of power of at least one engine at predetermined, spaced points along said proposed route.

4,538,230
METHOD AND APPARATUS FOR CONTROLLING ALTITUDE

Dennis K. Reust, Houston, Tex., and John S. Gergely, Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Oct. 29, 1982, Ser. No. 437,891
Int. Cl.³ G06G 7/78; G05D 1/00
U.S. Cl. 364—433 **14 Claims**



1. An apparatus for maintaining an object at a predetermined altitude by generating an altitude control signal from a first signal representing a first ambient condition and from a second signal representing a second ambient condition, said apparatus comprising:

means, responsive to said first signal, for providing a vertical velocity output;

integration means for integrating said second signal, thereby providing an integration output;

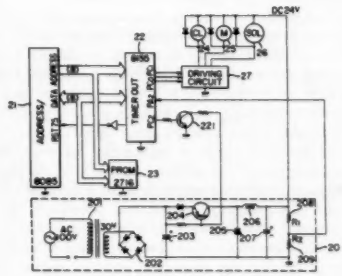
summing means for summing said vertical velocity output with said integration output, thereby providing a summed output;

comparison means for comparing said summed output with a predetermined reference signal representing an altitude to be maintained whereby said output of comparison means provides said altitude control signal, when said summed output differs from said predetermined reference signal and altitude control means responsive to said altitude control signal for maintaining said object at said predetermined altitude.

4,538,231
CIRCUIT FOR ELECTRIC POWER SOURCE

Shunichi Abe; Mitsuo Akiyama, and Yoshihiko Kudo, all of Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed May 19, 1982, Ser. No. 379,745
Claims priority, application Japan, May 28, 1981, 56-82373
Int. Cl.³ G05F 1/46; G06F 15/20
U.S. Cl. 364—483 **6 Claims**



1. A method for stabilizing an output of a D.C. power source by using a micro-computer comprising the steps of:

regulating an input voltage so as to provide an output voltage according to a controlling signal;

monitoring a voltage relating to said output voltage;

comparing said monitored voltage with a predetermined threshold voltage;

operating a periodic interruption process of said micro-computer in accordance with a timer sequence;

and generating said controlling signal for said regulating step so that said output voltage is stabilized according to said comparing step in said periodic interruption process.

5. An apparatus for stabilizing an output of a D.C. power source by using a micro-computer comprising:

regulating means for regulating an input voltage to provide an output voltage according to a controlling signal;

monitoring means for monitoring a voltage relating to said output voltage;

comparing means for comparing said monitored voltage with a predetermined threshold voltage;

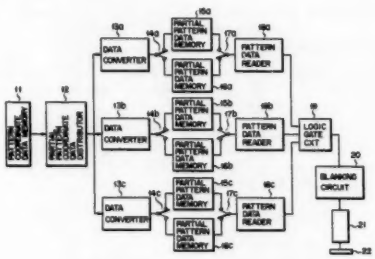
interrupting means for operating a periodic interruption process of said micro-computer in accordance with a timer sequence; and

generating means for generating said controlling signal for said regulating means so that said output voltage is stabilized by an output of said comparing means in said periodic interruption process.

4,538,232
ELECTRON-BEAM LITHOGRAPHIC APPARATUS

Kiyomi Koyama, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 21, 1982, Ser. No. 370,403
Claims priority, application Japan, Apr. 30, 1981, 56-65912
Int. Cl.³ G06F 15/40; G21G 5/00; G21K 5/00
U.S. Cl. 364—491 **7 Claims**



1. An electron-beam lithographic apparatus comprising:

means for generating address data corresponding to a plurality of partial patterns in parallel;

pattern memory means specified in parallel by the address data from said address data generating means for forming bit patterns corresponding to said partial patterns in parallel;

means for synchronously reading out in parallel said bit patterns from said memory means;

means for synthesizing said bit patterns read out in parallel by said reading means to produce a resultant bit pattern in the form of bit data; and

means for effecting blanking of an electron beam according to the bit data from said synthesizing means to thereby draw a pattern on an object;

wherein said pattern memory means is constituted by a plurality of pair memories, and one bit pattern is formed in one memory in each of said pair memories while previously written bit pattern is being read out from the other memory in each of said pair memories.

7. An electron-beam lithographic apparatus, comprising:

a main memory for storing a plurality of partial patterns;

a data distributor connected to said memory for distributing said partial patterns from said memory;

a plurality of parallel data converters for receiving said partial patterns from said data distributor;

a plurality of pairs of parallel pattern memories, each of said pairs being connected to a corresponding one of said data converters;

a plurality of pattern data readers, each of said readers being connected to a corresponding pair of pattern memories for receiving a partial pattern therefrom;

a first pattern memory of each pair being connected to a data converter while a second pattern memory of each pair is connected to said data reader, said pattern memories alternating connections so that each pattern memory alternately receives and stores a partial pattern from said data converter and reads out said partial pattern to said data reader;

a logic gate circuit for receiving a plurality of partial patterns from said plurality of data readers logically combining said partial patterns to form a complete pattern;

a blanking circuit connected to said logic gate circuit for blanking an electron beam according to said complete pattern.

4,538,233

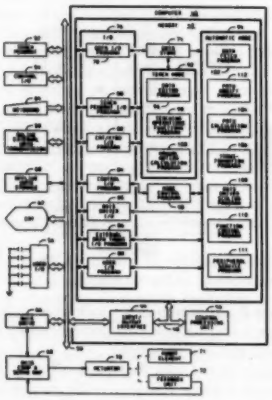
APPARATUS AND METHOD FOR OSCILLATORY MOTION CONTROL

Brian J. Resnick; Elena R. Messina; Madhukar Bhatia, and John G. Holmes, all of Cincinnati, Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Oct. 19, 1982, Ser. No. 435,259

Int. Cl.³ G06F *15/46*; G05B *19/42*

U.S. Cl. 364—513 **12 Claims**



1. Method for controlling the motion of a point associated with a function element carried by a machine, the machine having a plurality of movable members and actuators for effecting motion of the function element, the controlled motion describing an oscillatory pattern in a selectable plane through a linear path between two positions, the positions being defined by position input signals representing position coordinates relative to a predetermined coordinate system, the oscillatory pattern defining excursions about the path, the oscillatory pattern being defined by oscillatory pattern parameter input signals, the selectable plane orientation being defined by selectable plane input signals, and the point velocity being defined by a velocity input signal, the method comprising the steps of:

(a) producing an incremental distance signal in response to the position input signals and the velocity input signal, the incremental distance signal representing an increment of displacement defining an intermediate position along the linear path;

(b) producing an incremental pattern amplitude signal in response to the incremental distance signal and the pattern parameter input signals, the incremental pattern amplitude signal representing the amplitude of an excursion described by the oscillatory pattern at the intermediate position;

(c) producing increment coordinate signals in respone to the incremental distance signal, the incremental amplitude signal, and the selectable plane input signals, the increment coordinate signals representing coordinates with respect to the predetermined coordinate system of an intermediate position displaced from the path by the incremental excursion amplitude;

(d) producing actuator control signals in response to the increment coordinate signals, the actuator control signals representing machine member displacements between the position of the point and the position defined by the increment coordinate signals;

(e) applying the actuator control signals to the actuators to effect motion of the point to the intermediate position defined by the increment coordinate; and

(f) iterating steps (a) through (e) to move the point along the oscillatory pattern between the two positions.

4,538,234

ADAPTIVE PREDICTIVE PROCESSING SYSTEM

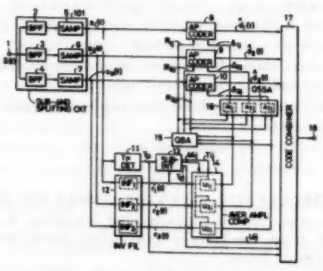
Masaaki Honda, Tokyo; Fumitada Itakura, Hoya, and Nobuhiko Kitawaki, Iruma, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed Sep. 2, 1982, Ser. No. 414,266

Claims priority, application Japan, Nov. 4, 1981, 56-177564

Int. Cl.³ G10L *1/00*

U.S. Cl. 364—513.5 **15 Claims**



1. An adaptive predictive processing system comprising:

sub-band splitting means for splitting an input signal into a plurality of sub-bands and producing sampled sub-band signals from the respective sub-bands;

adaptive predictive coding means connected to the respective outputs of said sub-band splitting means for subjecting the respective sub-band signals to adaptive predictive coding and producing adaptively quantized residual signals for the respective sub-bands, each of said adaptive predictive coding means including linear predictor means for producing a predicted value signal based on the quantized residual signal, a subtractor for receiving corresponding one of the subband signals from the input of said adaptive predictive means and the predicted value signal from said predictor means and providing therefrom a difference therebetween as a prediction residual signal, quantizer means connected to the output of said subtractor for producing the quantized residual signal, and adder means having inputs connected to the output sides of said quantizer means and said linear predictor means for adding the quantized residual signal and the predicted value signal to produce a locally decoded sub-band signal and

supplying the locally decoded sub-band signal to the input of said linear predictor means;

inverse filter means connected to the respective outputs of said sub-band splitting means for producing pseudo-residual signals of the respective sub-bands by subjecting the respective sub-band signals to inverse filtering processes;

pitch detecting means connected to one of the outputs of said sub-band splitting means corresponding to the lowest subband, for detecting a pitch period T_p of the sub-band signal;

sub-interval setting means connected to the output of said pitch detecting means and one of the outputs of said inverse filter means corresponding to the lowest sub-band, for dividing a pitch interval in the pseudo-residual signal equal to the detected pitch period into a plurality of sub-intervals and setting a sub-interval position T_d of the pitch interval relative to an analysis frame in the pseudo-residual signal;

average amplitude detecting means connected to the respective outputs of said inverse filter means and the output of said sub-interval setting means, for detecting average amplitudes Uij of the pseudo-residual signals in the respective subbands during each of the sub-intervals;

quantization bit number allocation means connected to the outputs of said average amplitude detecting means, for receiving the detected average amplitudes Uij of the respective pseudo-residual signals during each of the sub-intervals and computing, from the average amplitudes Uij, a number of bits Rij to be allocated to each of the sub-intervals in the respective sub-bands; and

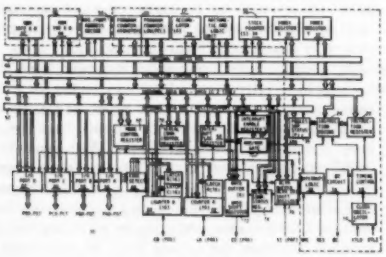
quantization step size computing means connected to the outputs of said quantization bit number allocation means and the output of said average amplitude detecting means, for receiving therefrom the computed allocation bit numbers Rij and the average amplitudes Uij and computing, from the allocation bit numbers and the average amplitudes, quantization step sizes Δij for the respective sub-intervals in the respective sub-bands, wherein the allocation bit numbers Rij from said quantization bit number allocation means and the quantization step sizes Δij from said quantization step size computing means are supplied to said quantizer means in said adaptive predictive coding means of the corresponding sub-band, thereby to adaptively control therewith the quantization of the prediction residual signals in the respective sub-bands.

4,538,235

MICROCOMPUTER RETRIGGERABLE INTERVAL COUNTER

Jerrold V. Henning, Anaheim, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 19, 1982, Ser. No. 409,485
Int. Cl.³ G06F 7/00
U.S. Cl. 364—569 **20 Claims**



1. A microcomputer having an interval counter for timing the duration between successive input signals so as to provide a maskable output interrupt signal which is indicative of said time duration and to which said microcomputer is responsive, said interval counter comprising:

receiving means for storing a preset count number corresponding to a preset time duration;

counting means for periodically decrementing a count number and producing said output interrupt signal when said count number is fully decremented and when the time interval between said input signals exceeds the count number; and

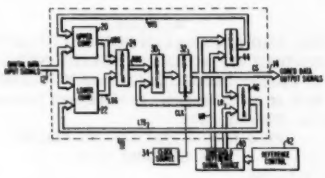
control means responsive to the receipt of said input signals in order to cause said preset count number to be transferred from said receiving means to said counting means.

4,538,236

ADAPTIVE DIGITAL SIGNAL CORING CIRCUIT

Robert A. Dischert, Burlington, N.J., and William H. Meise, Wrightstown, Pa., assignors to RCA Corporation, Princeton, N.J.

Filed Sep. 24, 1982, Ser. No. 422,667
Int. Cl.³ H04B 15/00; H04N 5/14
U.S. Cl. 364—574 **12 Claims**



1. Digital signal coring apparatus comprising:

a source of digital input signals;

a source of first and second digital signals having values which determine a range of digital values;

modifying means coupled to said source of first and second digital signals and responsive to a cored output signal for generating third and fourth digital signals corresponding to time varying upper and lower boundary values of said range of values;

comparison means coupled to outputs of said source of digital input signals and said modifying means, for producing signal sample values representing the degree to which the input digital signals depart from said range of digital values; and

means coupled to said comparison means and responsive to said signal sample values for producing said cored output signal by summing successive signal sample values.

4,538,237

METHOD AND APPARATUS FOR CALCULATING THE RESIDUE OF A BINARY NUMBER

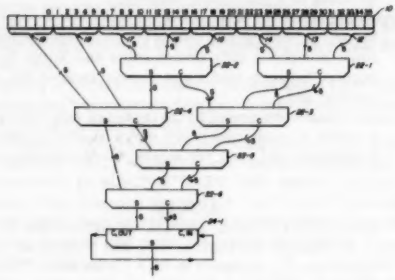
Joseph C. Circello, Phoenix, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Jan. 18, 1983, Ser. No. 458,795
Int. Cl.³ G06F 7/38
U.S. Cl. 364—746 **12 Claims**

1. Apparatus for calculating the residue of a binary number with respect to a check base, said binary number being partitioned into a plurality of equal sized segments, with each segment including b contiguous bits where b is an integer greater than one, comprising:

carry save adder means for adding the segments of the binary number and for reducing said segments to a single sum segment and a single rotated carry segment the single rotated carry segment being a carry segment wherein each bit position of the carry segment is increased in its bit significance by one, and further wherein the most significant bit is rotated to the least significant bit position; and

one's complement full adder means for adding said single sum segment and single rotated carry segment to produce



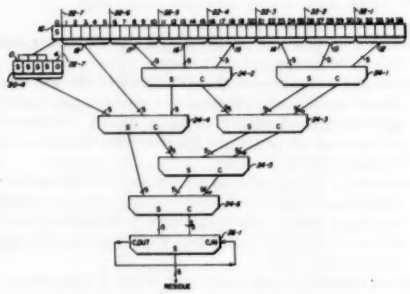
the residue of said binary number with respect to said check base.

4,538,238

METHOD AND APPARATUS FOR CALCULATING THE RESIDUE OF A SIGNED BINARY NUMBER

Joseph C. Circello, Phoenix, and Russell W. Guenthner, Glendale, both of Ariz., assignors to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Jan. 18, 1983, Ser. No. 458,794
Int. Cl.³ G06F 7/38
U.S. Cl. 364—746 **12 Claims**



1. Apparatus for calculating the residue of a signed binary number in two's complement notation, in which the most significant bit of the binary number is a sign bit, the bits of the binary number of lesser significance than the sign bit being partitioned into a plurality of equally sized number segments having segment boundaries, comprising:

circuit means for forming a sign segment having a segment boundary in which the sign position of the sign segment is filled with a logical zero and occupies the same position in the sign segment relative to a sign segment boundary as the sign bit of the number occupies with respect to the nearest boundary of a number segment, the other bit positions of the sign segment being filled with the sign bit;

carry save adder means for adding in 1's complement notation the number segments and sign segment and for reducing said segments to a single sum segment and a single rotated carry segment the single rotated carry segment being a carry segment wherein each bit position of the carry segment is increased in its bit significance by one, and further wherein the most significant bit is rotated to the least significant bit position; and

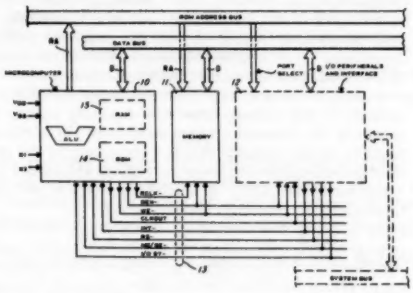
one's complement full adder means for adding said single sum and single rotated carry segment to produce the residue of said signed binary number.

4,538,239

HIGH-SPEED MULTIPLIER FOR MICROCOMPUTER USED IN DIGITAL SIGNAL PROCESSING SYSTEM

Surendar S. Magar, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 11, 1982, Ser. No. 347,859
Int. Cl.³ G06F 7/52
U.S. Cl. 364—759 **6 Claims**



1. A single-chip microprocessor device containing a multiplier circuit, and containing clock means to generate repetitive machine state intervals, said multiplier circuit operating to produce a product of first and second operands in a single one of said machine state intervals, said multiplier circuit comprising:

(a) a first input register for holding said first operand of N bits; and means for loading said first operand in a first machine state interval;

(b) a second input means for holding said second operand of M bits during a second machine state interval following said first interval;

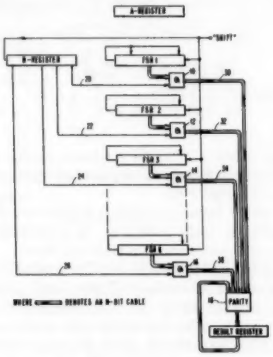
(c) N/2 static adder levels, each of said static adder levels including a control section having a plurality of inputs connected for receiving said control from said outputs of one of said decoder means, each level except the lowest containing at least M parallel binary adder stages, each stage of each level receiving one of said M bits from said second input means, the lowest level containing at least M adder stages receiving no carry input but only said controls and M bits, means for connecting partial products and carry from one level to the next higher level, but no carry being coupled along adder stages within a level.

(d) at least M+N dynamic adder stages, means for providing ripple carry along said dynamic adder stages, each stage receiving said partial product outputs from respective ones of said static adder levels, the MSB dynamic adder stages receiving partial product bits from the highest level of said static adder levels in a later part of a third machine state interval following said second machine state interval, the two LSB dynamic adder stages receiving two partial product bits from the lowest level of said static adder levels in an early part of said third machine state, and each pair of dynamic adder stages between LSBs and MSBs receiving two partial product bits from LSB stages of corresponding intervening static adder levels.

4,538,240
METHOD AND APPARATUS FOR PERFORMING HASHING OPERATIONS USING GALOIS FIELD MULTIPLICATION

John L. Carter, Putnam Valley; George Markowsky, Mount Kisco, and Mark N. Wegman, New York, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1982, Ser. No. 454,912
Int. Cl.[3] G06F *7/52*
U.S. Cl. 364—754 9 Claims

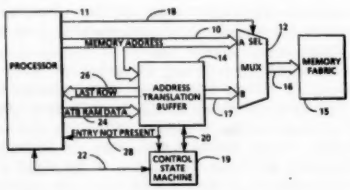


1. A hashing generator for performing a hashing operation on an N bit operand as a function of a predetermined N bit hashing constant, said generator comprising a shift register for receiving the operand to be hashed, a register for receiving and storing the hashing constant, K feedback shift registers wherein K is an integer factor of N, means for loading each of said K feedback shift registers with said hasing constant shifted from the low to the high order direction N/K-bit positions with respect to each of its adjacent feedback shift registers, means including a result register and combinatorial circuit means for accumulating the contents of each of said K feedback shift registers as a function of the binary state of an associated bit in said operand shift register together with the results of the immediately preceding accumulation and means for sequentially shifting all of said K feedback shift registers and said operand shift register and successively accumulating the interim results in said result register a total of N/K times to perform a complete hashing operation.

4,538,241
ADDRESS TRANSLATION BUFFER

Burton L. Levin; Andrew E. Phelps, both of San Diego, and Hanan Potash, La Jolla, all of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jul. 14, 1983, Ser. No. 513,660
Int. Cl.[3] G06F *13/00*
U.S. Cl. 364—900 9 Claims



1. An apparatus for translating a selected number of a first group of numbers into another number selected from a second group of numbers, said apparatus comprising:

a plurality of rows of content addressable memory means for storing said first group of numbers, including means for receiving said selected number from an external source and for providing a match signal indicating the row in which said selected number is stored;

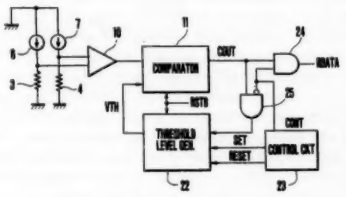
a corresponding plurality of rows of storage means for storing said second group of numbers including means for accessing the contents of the row of said storage means that corresponds to said match signal; wherein,

said rows of content addressable memory and said rows of storage means are coupled together by coupling means to form respective shift registers; and a control circuit means couples to both said shift registers for rewriting said numbers from the row in both shift registers corresponding to said match signal, into the first row of both shift registers in response to said match signal and for shifting down by one row all of the numbers stored in both shift registers above the row corresponding to said match signal.

4,538,242
SIGNAL PROCESSING CIRCUIT FOR MAGNETIC BUBBLE MEMORY DEVICES

Takashi Toyooka, 3-14-301, Tsutsujino, 259-1, Kamihirosi, Samama-shi, Saitama-ken; Aoki Hirokazu, 1-48-18, Akatsuki-machi, Hachiouji-shi, Tokyo; Mamoru Sugie, 25-18-710, Unoki, Sayama-shi, Saitama-ken, and Yutaka Sugita, 5-12-1, Nakaarai, Tokorozawa-shi, Saitama-ken, all of Japan

Filed Jul. 6, 1983, Ser. No. 511,334
Claims priority, application Japan, Jul. 9, 1982, 57-118554
Int. Cl.[3] G11C *19/08*
U.S. Cl. 365—8 3 Claims



1. A signal processing circuit for a magnetic bubble memory device having two bubble sensing elements, comprising:

a differential amplifier, connected to said two bubble sensing elements, for amplifying a difference between output signals from said two bubble sensing elements;

a comparator, connected to said differential amplifier, for comparing an output signal from said differential amplifier with a given reference level; and

reference level determining means, connected to said comparator, for changing the reference level during a period in which absence of a bubble is detected by the bubble sensing elements until the output of the comparator changes at a first reference level and for determining a second reference level for bubble read operation on the basis of the first reference level.

4,538,243

ASSOCIATIVE MEMORY WITH IMPROVED MEMORY CELL AND METHOD FOR OPERATING SAME

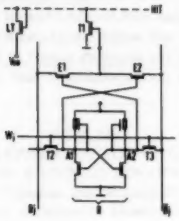
Bernd Zehner, Holzkirchen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 15, 1982, Ser. No. 418,526

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1981, 3138993

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—49 **4 Claims**



1. An associative memory having a plurality of memory cells arranged in i rows, each row having j cells for use with i word lines respectively for said rows, j bit lines and j complementary bit lines respectively for each of said cells, and at least one hit line, each said memory cell comprising:

a random access memory cell having first and second output terminals;

a pair of first transistors each having a control electrode connected to the word line for the row in which said cell is located and one of said first transistors being interconnected between said first terminal of said random access memory cell and the bit line for said cell and the other of said first transistors being interconnected between said second terminal of said random access memory cell and the complementary bit line for said cell;

a pair of second transistors having a common terminal, one of said second transistors having a control electrode connected to said first terminal of said random access memory cell and being connected to said complementary bit line for said cell and the other of said second transistors having a control electrode connected to said second terminal of said random access memory cell and being connected to said bit line for said cell;

a third transistor connected to said hit line and having

a control electrode connected to said common terminal of said second transistors,

and said associative memory further having i load transistors each having a current path connected between a supply voltage and said hit line and a control electrode for said current path also connected to said hit line, each said load transistor forming a NOR gate in combination with said third transistors of each said cell in a row whereby information on said bit line is written into said random access memory cell when said word line activated and information on said bit line is compared with information stored in said random access memory cell when said word line is non-activated and the result of said comparison is utilized for controlling said third transistor for enabling of inhibiting said hit line.

4,538,244

SEMICONDUCTOR MEMORY DEVICE

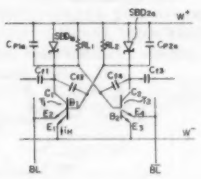
Yasuhisa Sugo, Yokohama, and Tohru Takeshima, Tokyo, both of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Dec. 27, 1984, Ser. No. 686,818

Claims priority, application Japan, Dec. 29, 1983, 58-247704

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—155 **8 Claims**



1. A semiconductor memory device comprising:

a plurality of word lines;

a plurality of bit lines intersecting to said word lines;

bipolar memory cells arranged on intersecting portions between said word lines and said bit lines;

each of said bipolar memory cells comprising a first transistor, a second transistor, and a load connected between the collector of each of said first transistor and said second transistor and one of said word lines;

the base and the collector of said first transistor being respectively connected to the collector and the base of said second transistor;

said load comprising a Schottky barrier diode and a load resistor connected in parallel;

said load further comprising a capacitor connected in parallel with said Schottky barrier diode;

each of said first transistor and said second transistor comprising a semiconductor layer having a first conductivity type and operatively functioning as a collector region; and

a high concentration buried layer formed in said semiconductor layer and having said first conductivity type;

said Schottky barrier diode comprising a Schottky barrier region formed at the surface of said semiconductor layer;

in said Schottky barrier region, a semiconductor region having a second conductivity type being formed so as to reach said high concentration buried layer;

said capacitor being formed by a junction between said semiconductor region and said high concentration buried layer.

4,538,245

ENABLING CIRCUIT FOR REDUNDANT WORD LINES IN A SEMICONDUCTOR MEMORY ARRAY

George Smarandoiu, Palo Alto, and George Perlegos, Fremont, both of Calif., assignors to SEEQ Technology, Inc., San Jose, Calif.

Filed Apr. 12, 1982, Ser. No. 367,331

Int. Cl.³ G11C *11/40*

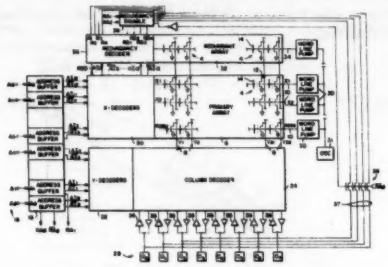
U.S. Cl. 365—200 **30 Claims**

1. Apparatus for enabling a redundant word line in a semiconductor memory whenever selected memory address indicators are input to the semiconductor memory, said apparatus comprising:

decoder means for accessing the redundant word line and raising the voltage thereon, said decoder means including a first circuit structure which is programmed to receive the selected memory address indicators such that said decoder means accesses and raises the voltage on the redundant word line in response to the input of the selected memory address indicators to the semiconductor memory; and

preventing the reprogramming of said first circuit structure with memory address indicators different than the se-

lected memory address indicators after said first circuit structure has been programmed to receive the selected memory address indicators, said disabling means including



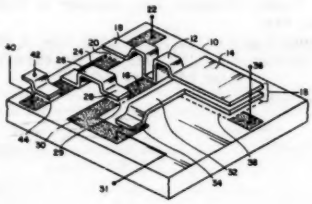
a second circuit structure which outputs a signal indicative of the fact that said first circuit structure has been programmed.

4,538,246

NONVOLATILE MEMORY CELL

Samuel T. Wang, San Jose; Chenming Hu, Hercules, and Ying Shum, Cupertino, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Oct. 29, 1982, Ser. No. 437,608
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—226 **9 Claims**



1. A nonvolatile static semiconductor random access memory cell for use in array of cells comprising:

means to generate a store signal if the power to said cell is interrupted;

a bistable circuit operable to maintain a first state when switched to said first state and operable to maintain a second state when switched to said second state;

floating gate means operable to maintain a first negatively charged condition in response to said store signal if said bistable circuit is in one of said states and a second uncharged condition if said bistable circuit is in the other state, said first and second conditions being maintained when outside power is interrupted;

disabling means connected to prevent said bistable circuit from assuming said first state, when power is restored, if said floating gate means is in said first condition; and

reset means operable to set said bistable circuit to said first state upon restoration of power unless said disabling means prevents reset

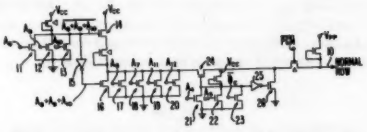
wherein said bistable circuit comprises first, second, and third nodes, a first FET connected between said first node and the array supply voltage with its gate connected to said second node, a second FET connected between said second and third nodes with its gate connected to said first node, a variable voltage supply connected to said third node, said bistable circuit being switched to said first and second states by the application of first and second voltages respectively to said first node.

4,538,247

REDUNDANT ROWS IN INTEGRATED CIRCUIT MEMORIES

Kalyanasundaram Venkateswaran, San Jose, Calif., assignor to Fairchild Research Center, Mountain View, Calif.

Filed Jan. 14, 1983, Ser. No. 457,999
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—230 **18 Claims**



1. Decoding apparatus for an integrated circuit memory having first rows of memory cells, each first row being selectable by a row address, including at least one address bit, and having at least one second row selectively connectable in place of one of the first rows, the apparatus comprising:

at least one redundant decoder means, each redundant decoder means being connected to a second row, including a plurality of selectable connections for creating an address for the connected second row, and including means for producing an address signal of a first level if the row address corresponds to the created address and of a second level if the row address does not correspond to the created address;

logic means for generating a control signal of a first state until an address bit is supplied to the memory and of a second state if at least one address signal from the at least one second row is of the first level; and

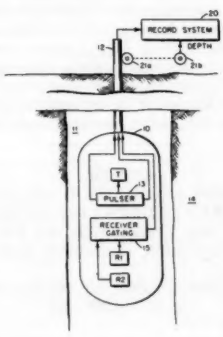
decoder means connected to each first row to receive the control signal from the logic means for controlling the first rows in response thereto.

4,538,248

RECORDING SYSTEM FOR A BOREHOLE LOGGING TOOL

Wilfred K. Lenhardt, Richardson, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 1, 1982, Ser. No. 364,364
Int. Cl.³ G01V *1/40, 3/18, 5/04*
U.S. Cl. 367—25 **4 Claims**



1. A method for recording logging signals from a borehole

logging tool being moved through a borehole traversing subterranean formations, comprising the steps of:

(a) recording said logging signals on a moving recording medium,

(b) driving said recording medium such that the logging signals produced for a select rate of movement of the logging tool in the borehole are recorded at a select rate of movement of said recording medium, the driving of said recording medium comprising increasing the rate of movement of said recording medium when said rate has decreased relative to the rate of movement of said borehole logging tool, and decreasing the rate of movement of said recording medium when said rate has increased relative to the rate of movement of said borehole logging tool,

(c) determining a proportionality for the rates of movement of said logging tool and said recording medium, and

(d) changing the rate of movement of said recording medium in response to changes in said proportionality.

4,538,249

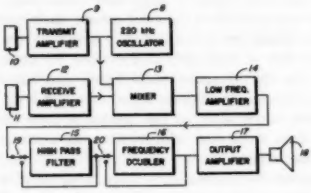
ULTRASONIC DOPPLER FISH DETECTOR

Joseph D. Richard, 531 S. Navy Blvd., Pensacola, Fla. 32507

Filed Sep. 29, 1982, Ser. No. 428,474

Int. Cl.³ A01K *97/12*; G08B *21/00*

U.S. Cl. 367—94 **5 Claims**



1. An ultrasonic Doppler apparatus for detecting normal fish movements or reactive fish movements in response to a fish lure or other artificial stimulus comprising:

means for directionally transmitting an ultrasonic signal into a body of water, the said transmitted ultrasonic signal having a frequency effective to penetrate particulate suspensions commonly encountered in natural bodies of water;

means for directionally receiving ultrasonic signals from the aforementioned body of water resulting from reflections of the said transmitted signal;

means for deriving a Doppler signal having frequency characteristics dependent on the frequency difference between said transmitted and received ultrasonic signals; means for multiplying the frequency of the said Doppler signal, so that at least some sub-sonic components in the said Doppler signal are made sonic; and electroacoustic means for generating an acoustic output signal having frequency characteristics dependent on the frequency of the said multiplied Doppler signal, the said acoustic signal being an audible indication of the movements of fish, including slow moving fish, in the aforementioned body of water.

4,538,250

CONSTRUCTION AND METHOD FOR ELONGATED TOWED UNDERWATER SONAR

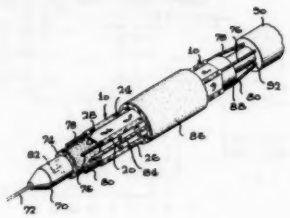
Frederick C. De Metz, Granada Hills, and John R. Rackliffe, Sepulveda, both of Calif., assignors to Allied Corporation, Morristown, N.J.

Filed Dec. 27, 1982, Ser. No. 453,305

Int. Cl.³ H04R *1/44*

U.S. Cl. 367—154 **8 Claims**

1. A construction for an elongated towed underwater acoustic array including a plurality of hydrophones and circuit modules interconnected by electrical conducting wires, a substantially continuous sheath of plastic foam material surrounding said hydrophones and said circuit modules, a hose-like jacket of durable plastic material surrounding and containing said sheath, a plurality of strength members contained in said hose-like jacket, and connector members at each end of said array to which said strength members and said electrical wires are attached,



characterized in that an elongated tube-like retaining member is interposed between said sheath and said jacket, said retaining member comprising a cylindrical tube of synthetic fabric, said fabric being longitudinally stitched or seamed at a plurality of locations to provide a structure with a large center tube and a plurality of spaced parallel peripheral tubes of small diameter, each of said peripheral tubes containing one of said strength members.

4,538,251

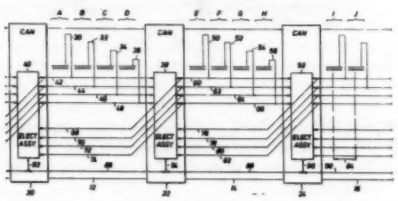
MARINE SEISMIC STREAMER CABLE FOR PROVIDING SELECTABLE DETECTOR ARRAY CONNECTIONS

David R. Steetle, Houston, Tex., assignor to Digicon, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 472,136, Mar. 4, 1983,. This application Apr. 11, 1983, Ser. No. 483,623

Int. Cl.³ G01V *1/38*

U.S. Cl. 367—154 **12 Claims**



1. A marine seismic cable including a plurality of identical sections successively connected together by identical end connectors,

each of said sections comprising a plurality of linearly arrayed pressure detector groups which produce a composite electrical signal in response to the immediate pressure on the individual detectors within the group, each of said groups having the same number of detectors,

each of said connectors comprising an electronic assembly for receiving said separate composite signals from the plurality of detector groups in the preceding cable section to a first side of said connector and for receiving separate composite signals from the plurality of detector groups in the succeeding cable section to the second side of said connector for producing selectable-and-combinable outputs signals from said first side composite signals and said second side composite signals,

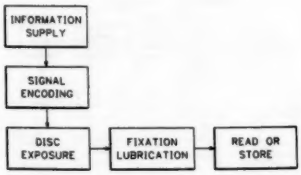
each of said cable sections further comprising wiring for connecting said end connector to the opposite end connector to carry signals originating from detectors in said cable section, signals originating from detectors in the succeeding cable section, and said selectable-and-combinable output signals.

4,538,252

LIGHT INDUCED CAPACITANCE CHANGES IN DONOR POLYMERS (OR SMALL MOLECULES) FILMS AND ITS USE FOR INFORMATION STORAGE IN VIDEO DISKS AND THE LIKE

Ari Aviram, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 24, 1981, Ser. No. 295,210
Int. Cl.[3] G11B *11/00, 11/12*
U.S. Cl. 369—13 8 Claims



1. A method for capacitively storing data on a grooveless storage device including the steps of

(a) providing a storage device comprised of a conductive substrate having coated thereon a grooveless layer of a donor molecule composition which changes its dielectric constant when irradiated;

(b) projecting data in the form of light in a predetermined pattern onto the surface of said grooveless layer of donor molecule composition to effect changes in the dielectric constant in said layer in said predetermined pattern; and

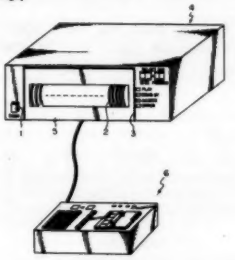
(c) heating said exposed storage device to fix said predetermined pattern thereon.

4,538,253

DISC PLAYING SYSTEM WITH CONTINUOUS PLAYING FUNCTION

Masaya Ishibashi, and Atuki Tada, both of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Aug. 10, 1984, Ser. No. 639,469
Claims priority, application Japan, Aug. 12, 1983, 58-147828
Int. Cl.[3] G11B *15/00, 17/08*
U.S. Cl. 369—34 1 Claim



1. A disc playing system for playing selected ones of a plurality of stored discs in succession, comprising:

a disc storing part in which the plurality of discs are juxtaposed in a predetermined direction;

a disc carrying means slidable along said direction of arrangement of discs for carrying the disc to a playing position;

a transportation means for transporting a disc between said disc carrying means and said disc storing part;

a memory means for memorizing a correspondence between numbers assigned to each disc and numbers assigned to each storing position of said disc storing part;

a detection means for detecting a playing frequency of each disc; and

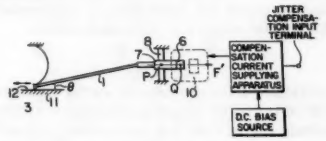
a control means for operating said disc carrying means and said transportation means for altering an order of arrangement of the discs in the disc storing part and altering said memorized correspondence in accordance with a detected result from of said detection means.

4,538,254

PICKUP DEVICE

Osamu Hattori, Chigasaki, and Shingo Tamura, Yokohama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 15, 1982, Ser. No. 418,253
Claims priority, application Japan, Sep. 18, 1981, 56-146211
Int. Cl.[3] G11B *17/00*
U.S. Cl. 369—43 5 Claims



1. A pickup device comprising:

a scanning needle having a signal detecting electrode;

a cantilever having said scanning needle mounted at one end thereof and a permanent magnet mounted at the other end thereof;

a support for resiliently supporting said cantilever;

a jitter compensation drive coil for generating a magnetic field to be acted on said permanent magnet;

a current flowing in said drive coil being varied to drive said scanning needle in the direction of a record track of a disc to compensate for jitter;

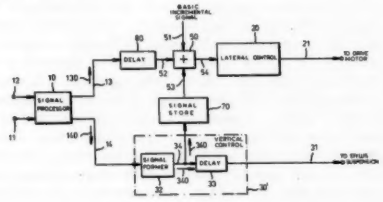
said support and said permanent magnet being arranged relative to each other such that a line connecting a support point of said support and a center of said permanent magnet is in parallel to a surface of said disc.

4,538,255

METHOD OF AND SYSTEM FOR CUTTING A PHONOGRAPH RECORD WITH TWO-CHANNEL MODULATION

Otmar Kern, Berlin, Fed. Rep. of Germany, assignor to Georg Neumann GmbH, Berlin, Fed. Rep. of Germany

Filed Oct. 21, 1983, Ser. No. 544,404
Claims priority, application Fed. Rep. of Germany, Oct. 22, 1982, 3239199
Int. Cl.[3] G11B *3/74*
U.S. Cl. 369—51 7 Claims



1. A method of controlling the mean depth and spacing of V-groove cut by a stylus into a surface of a rotating phonograph disk for recording sound signals from two separate channels in the form of undulations of respective groove flanks in response to corresponding modulation signals picked up from respective tracks of a storage medium, the stylus being provided with a support movable both perpendicularly to the disk surface and laterally thereacross, comprising the steps of:

(a) picking up respective preview signals from said tracks with a predetermined lead time in advance of said modulation signals;

(b) deriving a first and a second signal component from a combination of said preview signals;

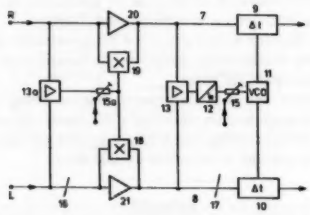
(c) converting said first signal component into a vertical-deflection signal with a rise time which is a small fraction of said lead time;
(d) combining one part of said vertical-deflection signal with said second signal component and with a basic incremental signal to produce a composite signal;
(e) deriving from said composite signal a lateral-deflection signal with a rise time on the order of said lead time effective to control a displacement of the stylus support across the disk surface at an instant following by said lead time the pickup in step (a); and
(f) delaying another part of said vertical-deflection signal to render same effective concurrently with said lateral-deflection signal for controlling a displacement of the stylus support transverse to the disk surface.

4,538,256

METHOD AND APPARATUS FOR CUTTING INFORMATION INTO A RECORD CARRIER

Horst Redlich, Berlin, Fed. Rep. of Germany, assignor to TELDEC Telefunken-Decca Schallplatten GmbH, Hamburg, Fed. Rep. of Germany

Filed Nov. 16, 1982, Ser. No. 442,123
Claims priority, application Fed. Rep. of Germany, Nov. 16, 1981, 3145477; Oct. 7, 1982, 3237135
Int. Cl.³ G11B *3/00*
U.S. Cl. 369—88 **10 Claims**



9. A method for producing a mechanically reproducible recording in a metal disk record by operating an electrically excited cutting stylus to cut a modulated groove in the record, comprising:
orienting the cutting stylus to be driven at a tracking angle of less than 20°;
providing two stereo signals to be recorded;
electronically compensating distortions caused by the tracking angle by deriving a representation of the amplitude of recording depth component which will be produced by the signals, producing oscillations at a frequency dependent on the amplitude of the depth recording component by means of a voltage controlled oscillator controlled by the representation, and delaying the signals as a function of the frequency of the oscillations by means of a controllable delay member controlled by the oscillator and connected to conduct the signals to the cutting stylus; and
compensating low frequency distortions introduced into the signals by said step of electronically compensating by adding to each signal, before it is conducted to the cutting stylus, a compensating component equal in amplitude and opposite in phase to the low frequency distortions.

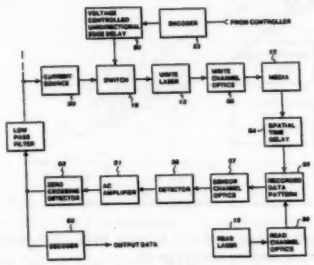
4,538,257

ADAPTIVELY STABILIZED RECORDING FOR DIRECT READ AFTER WRITE OPTICAL MEMORIES

Lance T. Klinger, Mt. View, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 23, 1982, Ser. No. 452,657
Int. Cl.³ G11B *7/00*; G01D *15/14*
U.S. Cl. 369—106 **6 Claims**

1. In a direct read after write optical memory having source means for supplying a write light beam and a read light beam, a detector, optical means for focusing said write and read beams on a recording medium such that said read beam trails immediately behind said write beam and for returning reflected read beam light from said recording medium to said detector, and an encoder coupled to said source means for intensity modulating said write beam in accordance with a code having a predetermined average dc content to record data on said recording medium; an improved feedback means coupled



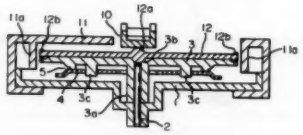
between said detector and said source means for continuously adjusting said write beam to cause said recorded data to have substantially the same average dc content as said code; said feedback means comprising an ac coupled amplifier coupled to said detector, a zero-crossing detector coupled to said amplifier, and a low pass filter coupled to said zero-crossing detector to provide an error signal for adjusting the intensity of said write beam and for isolating said error signal from spurious influences.

4,538,258

RECORD

Haruyoshi Miyako, and Kiyoteru Arima, both of Nagano, Japan, assignors to Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano, Japan

Filed Aug. 26, 1983, Ser. No. 526,842
Claims priority, application Japan, Aug. 31, 1982, 57-132181
Int. Cl.³ G11B *23/00, 25/04*
U.S. Cl. 369—271 **3 Claims**

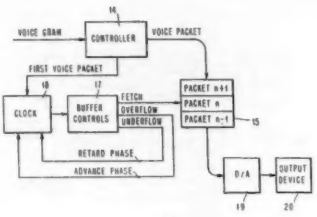


1. A record for play on a turntable having a central concave indentation and one or more circumferentially varying indentations on a circumference of said turntable, comprising:
a flat disc (**12**);
a convex protrusion (**12*a***) substantially at the center of said disc for engaging said central indentation and centering said disc; and
one or more protrusions (**12*b***) formed on the circumferential periphery of said disc for engaging said circumferentially varying indentations and for rotating said disc as said turntable rotates, said peripheral protrusions varying circumferentially around said disc, insertable into one of said indentations and contactable with a circumferential side of said one indentation.

4,538,259
SYSTEM FOR DIGITIZED VOICE AND DATA WITH MEANS TO COMPENSATE FOR VARIABLE PATH DELAYS

Brian B. Moore, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 5, 1983, Ser. No. 511,059
Int. Cl.³ H04J *3/02*; H04Q *11/04*; H04J *6/00*
U.S. Cl. 370—60 **5 Claims**



1. In a communication system of the type in which voice signals for a sending station are formed into a packet and in which Packets from several sending stations are combined into a message and are transmitted to intended receiving stations, the system having alternate pathways through intermediate stations such that messages containing first or subsequent packets in a conversation may arrive at an intended receiving station at varying times in relation of the time when the voice signal originated, the intermediate stations having means for handling a message according to a priority carried by the message, and in which the receiving station has means for delaying the output of the first packet of a conversation to compensate for variations in the delays of said subsequent packets, the improvement comprising,

means at the sending station for designating a message containing a first packet of a conversation to have a higher priority and for designating messages not containing a first packet of a conversation to have a lower priority,

whereby the range of delays for the first packet of a conversation transmitted through said pathways is less than the range of delays for packets transmitted at a lower priority and thereby a reduction is made in the range of the minimum time interval between the latest arrival of said first packet of a conversation and the earliest arrival of a message containing the next packet of the same conversation, and

means in a receiving station for delaying the first packet by an amount that is related to the more closely defined range of time intervals between said first packet and said next packet and is appropriate to a wide range of delays in the subsequent messages.

4,538,260
ELECTRONIC TIME SWITCH

Tadanobu Nikaido, Isehara, Japan, assignor to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed Aug. 22, 1983, Ser. No. 525,566
Claims priority, application Japan, Aug. 30, 1982, 57-150310; Feb. 26, 1983, 58-31651; Aug. 15, 1983, 58-149079
Int. Cl.³ H04J *3/04*; H04Q *11/04*
U.S. Cl. 370—66 **9 Claims**

1. An electronic time switch comprising

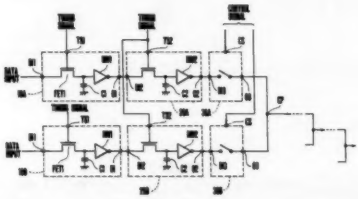
a plurality of successive stages, each stage having one or more units and each unit including serially connected first and second registers operating to receive input data at different times and a switch connected to the output of each second register, the operation of said switch being controlled by a control signal;

the units of a stage being formed as one or more groups thereof, the number of units in a stage other than the first stage being the same as the number of groups in a preceding stage;

the switches in each group of a stage having a common connection point, the connection points of the group in a preceding stage being connected to the first registers in the units of a succeeding stage, which units correspond to the groups in said preceding stage;

means for sequentially applying control signals having different switch connection times at predetermined time spacings to the switches in said stages;

the first registers of the first stage sequentially storing sequentially applied data at a first time;



means for applying a common frame pulse to the second registers of the first stage for storing the contents of respective first registers;

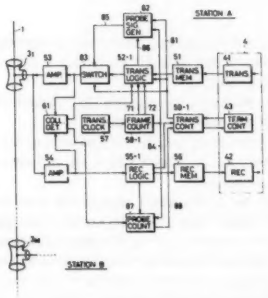
the first registers of the second and succeeding stages sequentially storing data at a second time; and

the second registers of the second and succeeding stages sequentially storing data at a third time which is synchronous with but different from the second time, thereby providing data, which has been stored at a predetermined time, at a different time.

4,538,261
CHANNEL ACCESS SYSTEM

Hiroshi Kume, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jun. 29, 1983, Ser. No. 509,007
Claims priority, application Japan, Jun. 29, 1982, 57/110593
Int. Cl.³ H04J *3/02*
U.S. Cl. 370—85 **23 Claims**



1. A channel access system in a communication network of the type wherein a plurality of stations communicate with one another over a communication medium and wherein data signals on said medium are grouped into frames periodically occurring on a time axis, with each frame comprising a plurality of successively occurring blocks, each station including packet transmitting means for transmitting packet signals onto said medium to occupy a previously unoccupied block, whereby multiplexed digital signals are transmitted on said

medium in a time division manner, said channel access system comprising:

means for dividing a first block into a plurality of time slots;

probe signal transmitting means at a particular station for transmitting a probe signal in one of said time slots when said particular station desires to transmit a packet signal in said first block; and

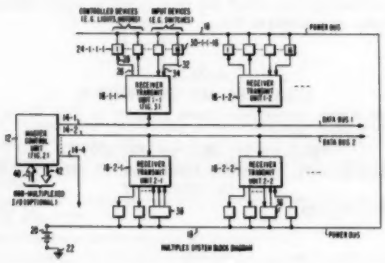
monitoring means for monitoring said one time slot to count the number of probe signals occurring in said time slot and to determine if more than one probe signal occurs in said one time slot, whereby said particular station is given occupation of said first block in accordance with the number of probe signals counted in said one time slot.

4,538,262

MULTIPLEX BUS SYSTEM FOR CONTROLLING THE TRANSMISSION OF DATA BETWEEN A MASTER CONTROL UNIT AND A PLURALITY OF REMOTELY LOCATED RECEIVER-TRANSMITTER UNITS

Joseph O. Sinniger, Pennington, and Richard M. Peterson, W. Windsor Township, Mercer County, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Aug. 3, 1983, Ser. No. 520,122
Int. Cl.³ H04J *3/06, 3/02*
U.S. Cl. 370—85 **17 Claims**



1. A multiplex bus system comprising in combination:

a master control unit (MCU) including a signal producing first clock source;

at least one receiver-transmit unit (RTU) including a signal producing second clock source;

bus means connecting said MCU and said at least one RTU for facilitating the transmission of information-bearing signals therebetween;

wherein said MCU transmits signals via said bus means to said RTU in the form of messages, each message comprising a synchronization pulse of known duration XT and a plurality of data bits of known duration T, wherein each of said messages includes a portion for the transmission of data bits from said RTU to said MCU;

said MCU including means utilizing said first clock source signal for determining said duration T;

said RTU including means responsive to the duration of said synchronization signal and to said second clock source signal for producing a signal representing said duration T as a function of said second clock source frequency; and

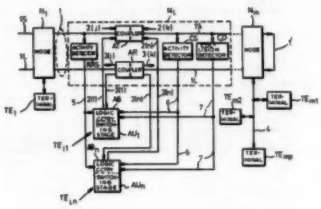
said RTU including means utilizing said signal representing said duration T for thereafter clocking said data bits from said MCU to said RTU into said RTU.

4,538,263

VARIABLE-BAND SWITCHING SYSTEM FOR VOICE AND DATA COMMUNICATION

Luciano Gabrielli, Leini, and Maurizio Sposini, Rivalta di Torino, both of Italy, assignors to Cselt Centro Studi e Laboratori Telecommunicazioni SpA, Turin, Italy

Filed Jun. 8, 1983, Ser. No. 502,084
Claims priority, application Italy, Jun. 9, 1982, 67736 A/82
Int. Cl.³ H04J *3/00*
U.S. Cl. 370—86 **9 Claims**



1. A communication system wherein a plurality of nodes are associated with respective groups of subscriber terminals adapted for the exchange of speech and data packets via a common unidirectional bus forming a loop with a transmitting branch and a receiving branch passing through all said nodes,

each node comprising an outgoing coupler and an incoming coupler linking all the terminals of the associated group with said transmitting branch and said receiving branch, respectively;

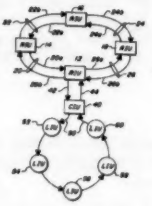
first and second detecting means in each node respectively disposed upstream and downstream of said outgoing coupler in said transmitting branch for recognizing the presence of signal carriers on said transmitting branch originating at any node upstream of a given node and at the given node itself and

logic circuitry at each terminal comprising a receiving section coupled to said incoming coupler, a transmitting section coupled to said outgoing coupler and control section coupled to said first detecting means, said second detecting means, said incoming coupler, said receiving section and said transmitting section, each terminal further comprising means connected to said transmitting section, for generating and storing speech packets, data packets and pre-engagement packets and for informing said transmitting section of the availability of such packets to be sent out, and means coupled to said receiving section for storing received speech packets, data packets and pre-engagement packets, said control section being responsive to signals from said first and second detecting means for enabling said transmitting section to send out a waiting packet in the absence of conflicting activity on said bus, said receiving section being responsive to the arrival of a pre-engagement packet addressed thereto for starting a time base in said control section to initiate a series of frames with a duration at least equal to the recurrence period of consecutively generated speech packets certaining to a particular voice communication between two terminals, said time base subdividing each frame into a voice period for the emission of at least one speech packet in an allocated time slot and a residual period reserved for the emission of data packets, said series of frames terminating in the absence of further packets to be sent out whereupon another terminal of the same node or of a node further downstream along said transmitting branch can send out packets in the course of a round giving all terminals successive access to said transmitting branch.

4,538,264
SELF-REPAIRING RING COMMUNICATIONS NETWORK

Richard G. Bahr, Framingham, and Russell L. Moore, Hudson, both of Mass., assignors to Prime Computer, Inc., Natick, Mass.

Filed Feb. 14, 1983, Ser. No. 466,108
Int. Cl.³ G06F 11/20
U.S. Cl. 371—8 2 Claims



1. A ring communications network comprising

a pair of oppositely directed, unidirectional, substantially parallel signal paths having a plurality of interface units (IU's) coupled in series along said pair of signal paths, whereby each IU is coupled to one inbound signal path and one outbound signal path from each of said parallel signal paths, wherein each of said IU's includes:

A. first detecting means for detecting when the two inbound signal paths coupled to that IU are operative and means responsive to said detection for coupling each of said inbound signal paths to the respective outbound signal path coupled to that IU which is parallel to the other inbound signal path,

B. second detecting means for detecting when one inbound signal path coupled to that IU is inoperative and means responsive to said detection for interrupting signal flow on the outbound signal path parallel to said one inbound signal path, and means for coupling the other inbound signal path to the outbound signal path parallel to said other inbound signal path,

C. reconnect network responsive to said second detecting means and operative when one of said inbound signal paths is inoperative, said reconnect network including means for periodically monitoring said inoperative inbound signal path, and including means for determining when said inoperative inbound signal path is again operative and, in response thereto for coupling said again operative inbound signal path to the outbound signal path at said IU which is parallel to the other inbound signal path at said IU and for coupling said other inbound signal path at said IU to the outbound signal path which is parallel to said again operative inbound signal path.

4,538,265
METHOD AND APPARATUS FOR INSTRUCTION PARITY ERROR RECOVERY

Michael N. Day, and Claude D. Miller, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 24, 1983, Ser. No. 478,574
Int. Cl.³ G06F 11/16
U.S. Cl. 371—12 4 Claims

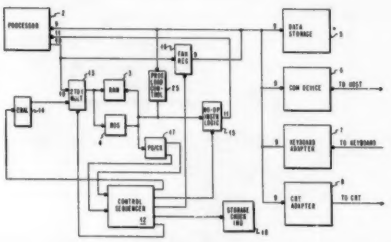
1. A method for automatic instruction parity error recovery in a programmable remote terminal connected to a host information processing system comprising the steps of:

(a) detecting the occurrence of a parity error during instruction fetch by the remote terminal processor;

(b) gating a No-Operation instruction onto the processor's instruction bus to replace the instruction containing the parity error;

(c) gating a branch instruction onto the processor's instruction bus for controlling the remote terminal processor to branch into an error recovery routine including utilizing said remote terminal processor to execute an error recovery program which comprises:

(d) storing the address of the instruction containing the parity error;



(e) logging the occurrence of the parity error to the host information processing system for recording;

(f) issuing a request to the host processing system for the instruction containing the parity error;

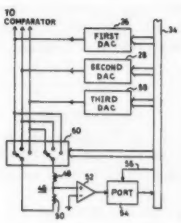
(g) reloading the instruction at the remote terminal processor memory address containing the parity error; and

(h) gating the address of the instruction onto the remote terminal processor's instruction bus for controlling the remote terminal processor to resume processing at the address where the parity error occurred.

4,538,266
DIAGNOSTIC APPARATUS FOR DIGITAL-TO-ANALOG CONVERTERS

Yasuhiko Miki, Tokyo, Japan, assignor to Sony/Tektronix Corporation, Tokyo, Japan

Filed Apr. 14, 1983, Ser. No. 484,799
Claims priority, application Japan, Aug. 30, 1982, 57-150598
Int. Cl.³ G06F 11/00
U.S. Cl. 371—15 19 Claims



11. A diagnostic apparatus for more than two digital-to-analog converters, comprising:

switch means for selecting two of the digital-to-analog converters;

digital signal generation means for applying digital signals to the selected two digital-to-analog converters, said digital signals being changed in sequence such that the analog output voltages from said two digital-to-analog converters are changed symmetrically with respect to a first predetermined voltage;

a resistor network for combining the analog output voltages from the selected two digital-to-analog converters; and

a comparator for comparing the output voltage from said resistor network with a second predetermined voltage, the

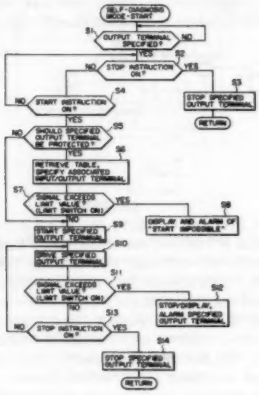
output signal from said comparator representing a diagnostic result of said selected digital-to-analog converters.

4,538,267

PROTECTING DEVICE IN SELF-DIAGNOSIS

Hiroyasu Uchida, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Aug. 9, 1982, Ser. No. 406,142
Claims priority, application Japan, Aug. 10, 1981, 56-124114
Int. Cl.³ G01R *31/28*
U.S. Cl. 371—20 **7 Claims**



1. In a copying machine of the type having output means comprising a plurality of electromechanical operating devices and activating means for activating said output means, and having a self-diagnosis mode of operation whereby a specified output means of said copying machine is activated by said activating means for testing purposes, and selection means manually operable by said operator for specifying desired output means, said selection means comprising control means on a machine front panel for designating individual ones of said operating devices to be activated for testing purposes, the improvement comprising:

protecting means, responsive to the operation of said selection means whereby a desired output means is specified, for automatically specifying at least one further output means to be activated during testing of said desired output means.

4,538,268

TEST-SIGNAL GENERATING DEVICE FOR TESTING ELECTRONIC EQUIPMENT

Luc Pham Van Cang, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Mar. 16, 1983, Ser. No. 476,021
Claims priority, application France, Mar. 19, 1982, 82 04752
Int. Cl.³ G01R *31/28*
U.S. Cl. 371—20 **10 Claims**

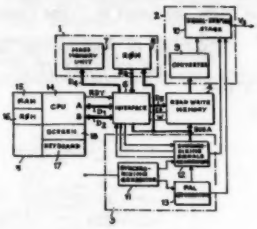
1. A test-signal generating device for testing electronic equipment and comprising means for storing test signals in the form of digital samples coupled to a digital-to-analog converter for converting the samples stored in digital form to analog signals at the output of the device, wherein said device comprises:

a read/write memory interposed between the analog-to-digital converter and the storage means;

a computer coupled to the storage means and to the read/write memory and comprising:

means for generating test signals in the form of digital samples;

means for transferring into the read/write memory the signals stored within the storage means and the test signals produced by the generating means;



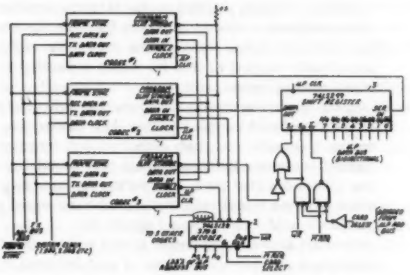
as well as means for synchronizing the transfer of samples stored within the read/write memory to the digital-to-analog converter.

4,538,269

PROGRAMMABLE CODING AND DECODING ARRANGEMENT

Milton R. Briscoe, Raleigh, N.C., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Apr. 18, 1983, Ser. No. 485,988
Int. Cl.³ G06F *11/02*
U.S. Cl. 371—22 **16 Claims**



1. A digital signal processing arrangement, comprising:

at least one communication path for digital communication signals;

signal processing means including a plurality of testable components interposed in respective sections of said communication path and each operative for processing digital signals passing therethrough;

at least one testing path connected to the respective section of said communication path at a juncture and bypassing at least one of said components;

at least one switching means interposed between the respective section of said communication path, the testing path, and the remainder of said communication path at a location situated at the opposite side of said one component from said juncture as considered in the direction of propagation of digital signals and operative for selectively connecting said remainder of said communication path with said section of said communication path in one switching position and with said testing path in another switching position thereof; and

means for so controlling the operation of said switching means as to cause said switching means to temporarily assume said other switching position thereof during testing of the performance of said signal processing means to thereby provide at least one testing route bypassing said

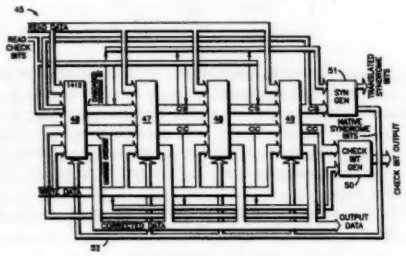
one component via said testing path for the signal processing means to process digital signals passing therethrough for subsequent evaluation to the exclusion of said one component.

4,538,270

METHOD AND APPARATUS FOR TRANSLATING A PREDETERMINED HAMMING CODE TO AN EXPANDED CLASS OF HAMMING CODES

Edgar R. Goodrich, Jr., Lubbock, and Philip Navratil, Austin, both of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 4, 1983, Ser. No. 481,606
Int. Cl.³ G06F *11/12*
U.S. Cl. 371—37 **5 Claims**



1. In an error checking and correcting system for encoding a sequence of data bits in accordance with a selected Hamming code to provide a set of native check bits, each of which is an output of a corresponding one of a set of predetermined parity trees applied across the sequence of said data bits, a method for translatiang the selected Hamming code to a selected one of an expanded class of modified Hamming codes, comprising the steps of:

selecting a predetermined subset of said parity trees;

selectively encoding the selected subset of said parity trees in accordance with a predetermined translation code to provide a modified parity tree;

providing a modified check bit as the output of said modified parity tree; and

substituting said modified check bit for a selected one of said native check bits, whereby the resultant set of check bits is characteristic of the sequence of data bits as encoded in accordance with said expanded class of modified Hamming codes.

4,538,271

SINGLE PARITY BIT GENERATION CIRCUIT

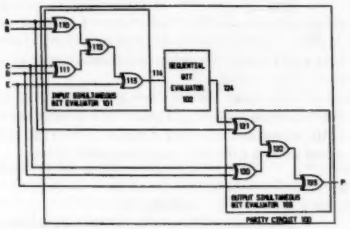
Dwight W. Kohs, Broomfield, Colo., assignor to AT&T Information Systems Inc., Holmdel, N.J.

Filed May 4, 1983, Ser. No. 491,279
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—49 **10 Claims**

6. In a data handling system, a parity circuit connected to a plurality of data transmission leads over which is transmitted a prescribed data set having n increments of data where each of said increments contains a like plurality of bits and where each of said increments included in said data set is serially transmitted to said parity circuit in synchronization with control signals that delimit the first and last increment of said prescribed data set, comprising:

means connected to said data transmission leads for simultaneously combining in response to a first control signal that delimits the first increment of said prescribed data set all of said bits in each one of said increments as received to produce an associated representative bit for each of the first received n−1 increments indicative of the odd or even number of 1 bits included in each received n−1 increment;

sequential bit evaluator means connected to said simultaneously combining means and responsive to said produced representative bits associated with said n−1 increments and further responsive to a second control signal that delimits the end of said prescribed data set as generated



with a receipt of a last increment n for generating an indicative bit representing the odd or even cumulative number of 1 bits included in all received n−1 increments; and

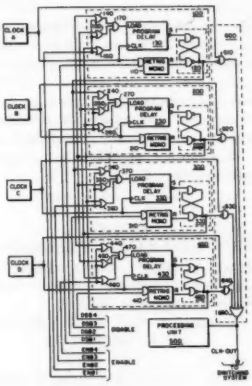
means connected to said sequential bit evaluator means and responsive to said indicative bit and the receipt of said n increment for generating a single parity bit indicative of the parity for said prescribed data set.

4,538,272

PRIORITIZED CLOCK SELECTION CIRCUIT

Ivan L. Edwards, West Lafayette, Ind., and Max S. Macrander, Warrenville, Ill., assignors to GTE Automatic Electric Incorporated, Northlake, Ill.

Filed Dec. 22, 1983, Ser. No. 564,270
Int. Cl.³ G06F *1/04, 11/20;* H04Q *3/54*
U.S. Cl. 371—61 **20 Claims**



1. A clock selection circuit for use in a switching system which includes a plurality of clock circuits, each being operative to provide a stream of clock pulses, said clock selection circuit comprising:

a plurality of delay circuits each connected to all but one associated clock circuit and each being operative to provide a time-out signal;

a plurality of clock pulse detection circuits, each connected to said associated clock circuit and operative, in response to an absence of a clock pulse for a predetermined time, to provide a clock failure signal;

a plurality of storage circuits each connected to a different one of said delay circuits and a different one of said detection circuits, and each being operative in response to the time-out signal from the connected delay circuit to provide a clock enable signal for said associated clock circuit, and each of said storage circuits being further operative in response to the clock failure signal from the connected clock pulse detection circuit to provide a clock disable signal for said associated clock circuit; and

a clock signal gating circuit connected to said plurality of clock circuits and said plurality of storage circuits and operative in response to each of said clock enable signal to gate clock pulses from the associated clock circuit to said switching system;

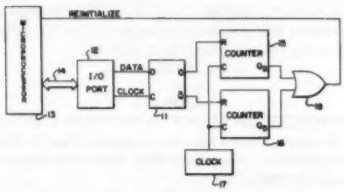
each of said delay circuits being operative in response to simultaneous presence of said clock disable signal from all of the unassociated clock circuits to provide said time-out signal after a different predetermined time.

4,538,273

DUAL INPUT WATCHDOG TIMER

George A. Lasser, Schaumburg, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 12, 1982, Ser. No. 441,005
Int. Cl.³ G06F *11/04*
U.S. Cl. 371—62 **9 Claims**



1. A dual input watchdog timer for processor means comprising:

dual input means having first and second inputs and having at least one output;

input connecting means for connecting said first and second inputs to a processor means such that said inputs receive signals from different software modules of said processor means; and,

output connecting means responsive to said at least one output of said dual input means for providing a reinitialization signal to said processor if said dual input means improperly receives said signals to said inputs within a predetermined amount of time.

4,538,274

Q-SWITCHED RAMAN LASER SYSTEM

E. Victor George, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 4, 1983, Ser. No. 455,445
Int. Cl.³ H01S *3/00*
U.S. Cl. 372—3 **9 Claims**

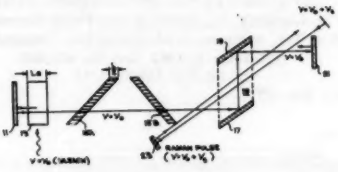
1. A method for producing a pulse of laser radiation of frequency $\nu=\nu_0+\Delta\nu_S$, the method comprising the steps of:

providing an optical cavity including two end mirrors, with a Raman cell, an energy storage laser amplifier and a saturable absorber therebetween, with the saturable absorber being positioned adjacent to one optical cavity end mirror, with the absorber density N, the length of the saturable absorber L_A, the absorber cross-sectional area Q_A, the effective amplifier gain length L and the amplifier gain per unit length αL satisfying $NQ_AL_A \gtrsim \alpha L$;

introducing into the Raman cell a Raman-active gas that is excited by passage therethrough of radiation of frequency $\nu=\nu_0$ and that emits radiation at the first Stokes or anti-Stokes frequency $\nu=\nu_0+\Delta\nu_S$ corresponding to excitation at frequency $\nu=\nu_0$;

introducing a small intensity pulse of predetermined frequency $\nu=\nu_0$ into the optical cavity and causing the pulse to propagate two or more times through the energy storage laser amplifier, the Raman cell, and the saturable absorber;

introducing a bleaching pulse centered at frequency $\nu=\nu_0$



into the saturable absorber so that the absorber becomes substantially transparent to radiation of frequency $\nu=\nu_0$;

shortly after introduction of the bleaching pulse, propagating a Raman pulse of predetermined frequency $\nu=\nu_0+\Delta\nu_S$ through the Raman cell in timed relationship with a counterpropagating pulse produced by the amplifier itself,

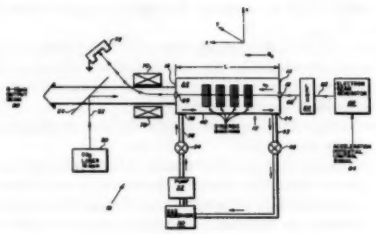
whereby a high intensity pulse of frequency $\nu=\nu_0+\Delta\nu_S$ issues from the Raman cell.

4,538,275

SYNERGISTIC QUASI-FREE ELECTRON LASER

Harold H. Szu, 9402 Wildoak Dr., Bethesda, Md. 20814

Filed Feb. 27, 1984, Ser. No. 584,224
Int. Cl.³ H01S *3/30*
U.S. Cl. 372—4 **17 Claims**



1. An infrared radiation generator device comprising:

means for producing a volume of ionized gas plasma;

means for directing an electron beam through said gas plasma in a first direction; and

means for directing a laser pump beam into said gas plasma in a second direction opposite said first direction to produce synergistic bunching of said electron beam and said gas plasma;

said synergistically bunched electron beam and gas plasma acting to backscatter a portion of said laser pump beam to form an output beam;

said output beam having a frequency Ω_1 as given by:

$$\Omega_1 = \Omega_o\left[\left(1+\frac{V_{ob}}{c}\right)/\left(1-\frac{V_{ob}}{c}\right)\right]$$

where:

Ω_o is the frequency of said laser pump beam;

V_{ob} is the velocity of said electron beam; and

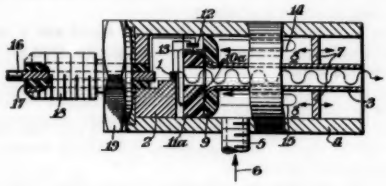
c is the free space velocity of light.

4,538,276

DIRECT MODULATION OF INJECTION LASERS

Hermann B. Sequeira, Baltimore, Md., and Jay E. Taylor, Elizabeth City, N.C., assignors to University of Delaware, Newark, Del.

Filed Jul. 27, 1982, Ser. No. 402,299
Int. Cl.³ H01S 3/02, 3/19
U.S. Cl. 372—26 2 Claims



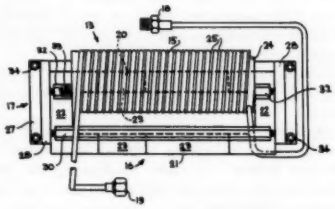
1. A laser diode system for modulating microwave signals wherein microwave signals of at least about 5 GHz frequency are caused to impinge on a laser diode, whereby said singals are translated to optical output consistent with the microwave signal, said system comprising a microwave channel for bringing microwave signals to said diode, a bias post for imposing a direct current bias signal on said diode, and an optical channel for carrying said optical signal out of the device, wherein said microwave channel comprises an annular space between said optical channel and a housing enclosing said system, and wherein said microwave channel, said bias post and said optical channel are colinear and said optical channel comprises means for essentially suppressing the propagation of microwave signals adventitiously present in said optical channel.

4,538,277

INDUCTIVE GAS LINE FOR PULSED LASERS

William J. Benett, Livermore, and Terry W. Alger, Tracy, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 29, 1982, Ser. No. 426,435
Int. Cl.³ H01S 3/00
U.S. Cl. 372—33 19 Claims



1. A method for eliminating an electrical discharge path through a gas inlet line connected to a gas discharge chamber utilizing pulsed electrical energy for producing the gas discharge, comprising the steps of:

utilizing a gas inlet line constructed of electrically conductive material,

forming the gas inlet line in a coil configuration, and

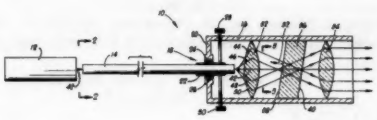
thereby providing animpedance with the coil to any pulsed electric current entering the gas inlet line.

4,538,278

APPARATUS AND METHOD FOR GENERATING LIGHT IN THE NEAR ULTRAVIOLET TO INFRARED RANGE

John S. Gergely, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed Sep. 2, 1982, Ser. No. 414,503
Int. Cl.³ H01S 3/091
U.S. Cl. 372—70 9 Claims



1. Apparatus for generating light of selected wavelength in the near ultraviolet to infrared wavelength range comprising:

a light source of linearly polarized light having a wavelength range of about 550–1100 nanometers;

a non-linear crystal;

an optical fiber having one end positioned adjacent said light source to permit transmission of said light within said fiber and the other end positioned adjacent said crystal to beam such transmitted light therethrough;

a dye cell positioned adjacent said crystal intercepting light therefrom, said cell including organic dye having an absorption spectrum in the ultraviolet range and a fluorescence emission spectrum in the near ultraviolet to infrared range; and

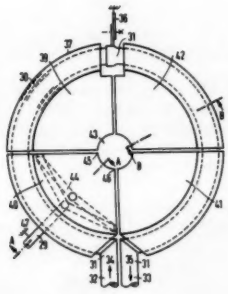
optical output means for passing only selected bandwidths of fluorescent light emitted from said dye cell.

4,538,279

INDUCTION COIL IN THE FORM OF A PANCAKE COIL FOR CRUCIBLE-FREE ZONE MELTING

Wolfgang Keller, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 15, 1983, Ser. No. 514,166
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1982, 3226713
Int. Cl.³ C03B 20/00; H05B 6/44
U.S. Cl. 373—139 27 Claims



1. Pancake induction heating coil for cruciblefree zone melting of semiconductor crystal rod, comprising a primary winding surrounding a semiconductor rod to be remelted in the form of a ring through which cooling liquid flows, a hollow secondary winding surrounding said primary winding, and an energy concentrator lying in the plane of said primary winding and having a circular opening formed substantially in the center thereof for the semiconductor rod, said secondary

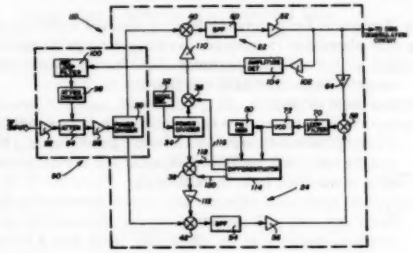
winding and said energy concentrator each being subdivided into at least two segments being electrically separated from each other, each of said segments of said secondary winding being connected to a respective one of said segments of said energy concentrator.

4,538,280

COHERENT SPREAD SPECTRUM PSEUDONOISE TRACKING LOOP

William H. Mosley, Jr., St. Petersburg, and Carl F. Andren, Indialantic, both of Fla., assignors to E-Systems, Inc., Dallas, Tex.

Filed May 5, 1983, Ser. No. 492,021
Int. Cl.³ H03D *1/22*
U.S. Cl. 375—1 **35 Claims**



30. A method of detecting a received data signal using a local generated reference signal comprising:

applying the received spread data signal to first and second channels;

generating the local reference signal having polarity transitions in response to a control signal;

demodulating within the first channel the received data signal in response to the local reference signal thereby generating a detected data signal;

detecting the polarity transitions in the local reference signal thereby generating a differential PN signal;

correlating within the second channel the received data signal and the differential PN signal thereby generating a recovered error signal; and

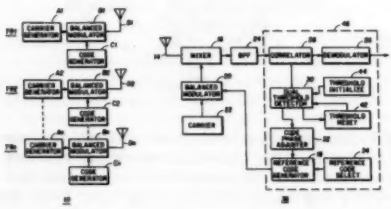
correlating the detected data signal and the error signal thereby generating the control signal.

4,538,281

ADAPTIVE ACQUISITION OF MULTIPLE ACCESS CODES

John A. Rajan, Hiawatha, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 6, 1982, Ser. No. 375,624
Int. Cl.³ H06K *1/04*
U.S. Cl. 375—2.2 **18 Claims**



16. In a direct sequence spread spectrum communication system having a plurality of transmitters and receivers wherein each of said transmitters transmit a differently coded carrier for code division multiplexing, and each receiver generates a reference code which is a replica of the code received from a transmitter from which reception is desired for enabling multiple access reception, said receivers including correlation controlled phase matching structure for measuring the correlation between the received code and reference code at successive different code phases for determining a match of the code phases, the improvement in said correlation controlled phase matching structure comprising:

means for establishing a first threshold signal and a second threshold signal having a magnitude greater than said first threshold signal;

means for detecting when a measured correlation exceeds said first or second threshold signals;

means for increasing the magnitude of said first and second threshold signals when a measured correlation exceeds said second threshold signal;

means for providing an indication of code phase when said measured correlation exceeds said first or second threshold signals; and

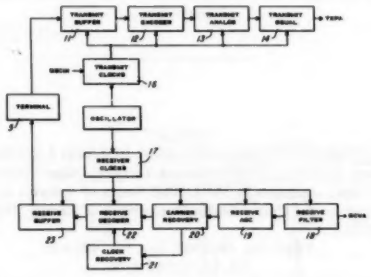
means for fixing the phase of the reference code at the phase represented by the most recent indication of code phase.

4,538,282

INTEGRATED CIRCUIT PSK MODEM PHASE LOCKED LOOP

James R. Hochschild, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 16, 1982, Ser. No. 408,558
Int. Cl.³ H03D *3/00*; H03B *3/06*
U.S. Cl. 375—9 **9 Claims**



1. An integrated circuit PSK modem for transmitting and receiving PSK signals derived from digital signals, the PSK signals being impressed on a first and second carrier frequency, respectively, comprising:

(a) transmit and encoding means for encoding digital data into a first format for conversion to corresponding PSK signals;

(b) transmit modulating means, implemented in sampled analog signal processing circuitry connected to receive the first format, for phase modulating the first carrier frequency according to the first format to provide corresponding PSK signal;

(c) receive demodulating means implemented in sampled analog signal processing circuitry, for demodulating the PSK signals on the second carrier frequency to provide PSK signals in a second format for conversion to corresponding digital signals, the demodulating means including a phase locked loop comprising low pass filter means for receiving an input voltage signal, integrator means connected to receive the output from the low pass filter means and to integrate the signal, parallel path means connected to the output of the low pass filter means and parallel with the integrator means, gain adjusting means

connected to receive the output from the integrator means and connected to sum with the output of the low pass filter means, the gain adjusted to a value that permits the low pass filter output to override the gain adjusting means output, and voltage controlled oscillator means connected to receive the summed output; and

(d) receive encoding means connected to receive the second format for encoding the second format to corresponding digital signals.

4,538,283

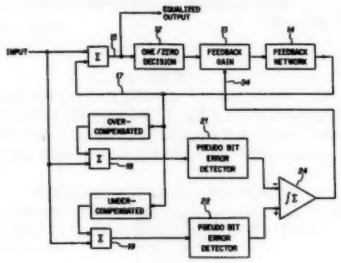
ADAPTIVE EQUALIZER SUITABLE FOR USE WITH FIBER OPTICS

Charles R. Hogge, Jr., Richardson, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 26, 1983, Ser. No. 517,317

Int. Cl.³ H04B *1/12*

U.S. Cl. 375—14 **10 Claims**



1. A circuit for adaptively equalizing a digital signal to compensate for distortion introduced by a transmission medium, comprising:

means for modifying said digital signal, to an extent established by a controlling input signal, to provide an output signal for said circuit, said means being responsive, in feedback relationship, to said output signal;

means, responsive to said output signal in feedback relationship, for modifying said digital signal by an amount selected to overcompensate said digital signal for said distortion, thereby providing an overcompensated control loop signal;

means, for modifying said digital signal by an amount selected to undercompensate said digital signal for said distortion, thereby providing an undercompensated control loop signal;

means for detecting errors in said overcompensated signal and errors in said undercompensated signal; and

means for detecting the difference between said errors detected in said overcompensated signal and said undercompensated signal and generating said controlling input signal dependent on said difference,

whereby said output signal is adaptively equalized.

4,538,284

SIGNAL STRUCTURES WITH DATA ENCODING/DECODING FOR QCM MODULATIONS

Gordon R. Lang, Bolton, Canada; George D. Forney, Jr.; Shahid Qureshi, both of Mansfield, Mass.; Fred M. Longstaff, Islington, and Chi H. Lee, Willowdale, both of Canada, assignors to ESE Limited, Rexdale, Canada

Filed Feb. 25, 1982, Ser. No. 352,207

Claims priority, application Canada, Mar. 25, 1981, 373861

Int. Cl.³ H03C *5/00*

U.S. Cl. 375—39 **31 Claims**

1. Means for providing QCM signals to a transmission link, comprising:

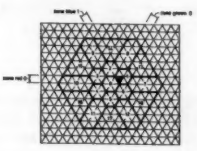
means for receiving binary signals,

means for converting groups corresponding to n of such binary signals having 2^n possible group values into signals represent a set of K signal message points each defined by Cartesian coordinate pairs where $K > 2^n$, the signal message points being substantially located at intersections on a regular equilateral triangular grid,

where each message point corresponds to only one group value of the 2^n possible values, and at least one of the 2^n possible values corresponds to at least two message points,

said converting means including means responsive to one of said at least one possible values for selecting at different times different ones of said at least two corresponding message points,

said converting means being designed, responsive to a continuing random sequence of said binary signals, to utilize



each of said K message points and to select message points corresponding to the at least one of the values, to substantially reduce the carrier component in said QCM signals,

means responsive to said message point signals for providing a pair of quadrature carriers respectively modulated in accord with the coordinates of said signal message points.

22. In a receiver for receiving QCM modulated signals wherein such modulated signals were encoded to represent the rectangular coordinates of signal points arranged at the intersection of lines on a regular equilateral triangular grid,

means for deriving said rectangular coordinates from the received signal,

means for converting said derived rectangular coordinates into sets of three signal values, each signal value being characteristic of a zone parallel to a different one of said triangular grid directions.

4,538,285

FM-RECEIVER FOR RECEIVING FM-SIGNALS WITH TRANSMISSION IDENTIFICATION

Gerardus C. M. Gielis, and Antoon M. M. Van Kessel, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 3, 1983, Ser. No. 472,375

Claims priority, application Netherlands, Mar. 15, 1982, 8201056

Int. Cl.³ H04B *1/10, 1/32*

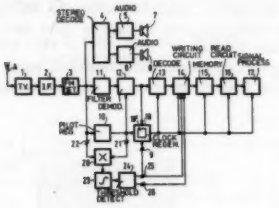
U.S. Cl. 375—104 **7 Claims**

1. An FM receiver for receiving an FM signal containing a transmission identification code of the type having an aerial input connected to a tuning unit, coupled to the combination of an IF unit, FM detector, pilot regeneration circuit and a demodulation circuit for demodulating said identification code, a circuit for processing said demodulated identification code comprising:

a clock regeneration circuit connected to said pilot regeneration circuit and said demodulation circuit which includes a resettable phase search circuit for producing a clock signal the frequency of which is derived from a regenerated pilot signal and the phase of which is derived from the demodulated code signal;

a clock controlled decoding circuit for decoding the code signals;

a switchable writing circuit for writing said code signals into a memory circuit;
a memory for receiving said decoded code signals as memory contents;
a reading circuit for reading the contents of said memory;
a signal unit connected to receive said read out memory contents controlled by said clock signal; and
interference detection means for detecting interference levels of a first and second level, said interference detector



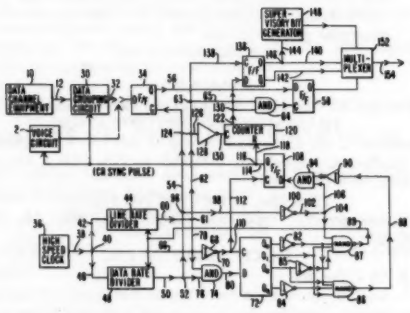
means having a control signal generation circuit connected to inhibit said writing circuit when an interference level of said first level is detected and resetting the clock regeneration circuit when interference levels of said second level are received, said first interference level being lower than said second interference level at which noticeable decoding errors occur, the second interference level being substantially equal to the interference level at which a phase slip of the clock signal occurs.

4,538,286

DATA RATE CONVERSION AND SUPERVISORY BIT INSERTION IN A DATA SYSTEM

John B. McNesby, Mesa, Ariz., and Joseph F. Krys, Denver, Colo., assignors to GTE Communications Products Corporation, Stamford, Conn.

Filed Jul. 26, 1983, Ser. No. 517,309
Int. Cl.[3] H04J *3/06*
U.S. Cl. 375—112 **6 Claims**



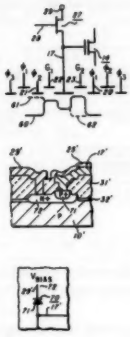
1. Digital transmission apparatus adapted to accept binary data from a data source and to convert said data into a serial pulse train formed of words having n bits per byte in n equal-length time slots at a line transmission rate L, and wherein said binary data has a bit rate M which is less than said line transmission rate L, said apparatus comprising:
timing means generating a first clock signal of bit rate L and a second clock signal of bit rate M;
synchronizing means, responsive to said second clock signal and to said binary data, providing a synchronized binary data signal in phase with said second clock signal of bit rate M;
retiming means, responsive to said first clock signal and to said synchronized binary data signal, providing a retimed binary data signal of bit rate M;
comparison means, responsive to said first and second clock signals, providing a coincidence output signal when said first and second clock signals are in phase alignment; and
multiplexing means for increasing the bit rate of said retimed binary data signal from M to L and for inserting additional bits into said retimed binary data signal at appropriate time slots in response to said coincidence output signal, and thereby providing a serial pulse train at the desired line transmission rate L.

4,538,287

FLOATING GATE AMPLIFIER USING CONDUCTIVE COUPLING FOR CHARGE COUPLED DEVICES

Charles G. Roberts, Plano, and Joseph E. Hall, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 4, 1979, Ser. No. 45,466
Int. Cl.[3] G11C *19/28;* H01L *29/78*
U.S. Cl. 377—60 **1 Claim**



1. A charge-coupled device comprising:
a substrate of semiconductor material of one type conductivity and having a first surface;
means defining a charge transfer channel extending along said first surface of said substrate;
a body of insulating material disposed on said first surface of said substrate;
first and second phase electrodes embedded within said insulating body and extending transversely across said channel in spaced relationship;
a floating gate electrode embedded within said insulating body between said phase electrodes and extending transversely across said channel in spaced relationship with respect to said first and second phase electrodes;
a pair of parallel spaced conductive control gates disposed on said insulating body in overlying relation to said channel, each of said control gates partially overlying said floating gate electrode and a respective one of said first and second phase electrodes but spaced therefrom by insulating material of said insulating body;
first and second regions of the other type conductivity disposed in said substrate in spaced relationship and adjacent to said channel;
said floating gate electrode extending between said first and second regions of the other type conductivity and cooperating therewith to define a transistor wherein the first and second regions of the other type conductivity form the source and drain and said floating gate electrode is the gate thereof;
an elongated conductive member defining a bias line disposed on said insulating body and overlying said substrate at a location remote from said channel;

voltage source means connected to said bias line for providing a constant voltage thereto;

a semiconductor diode formed in said substrate and extending between said bias line and said floating gate electrode, said semiconductor diode comprising a first diffused region of the other type conductivity in said substrate defining a cathode connected to said bias line and a second diffused region of one type conductivity in said first diffused region defining an anode connected to said floating gate electrode to conductively connect said bias line and said floating gate electrode for setting the potential on said floating gate electrode;

means operable to apply voltages to said control gates in a manner transferring respective charge packets along the charge transfer channel to and away from a position under said floating gate electrode; and

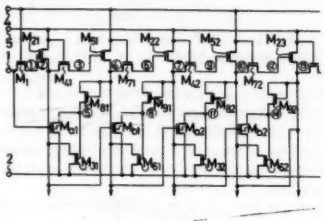
the potential on said floating gate electrode being changeable in response to a charge packet from the charge transfer channel being propagated thereunder for modulating the current flow in said transistor to produce an amplified output signal.

4,538,288

SHIFT REGISTER CIRCUIT WITH MULTIPLE, TAPPED OUTPUTS HAVING PULL-DOWN TRANSISTORS

Mitsuo Soneda; Toshikazu Maekawa, and Kouji Otsu, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 1, 1983, Ser. No. 528,465
Claims priority, application Japan, Sep. 8, 1982, 57-156317
Int. Cl.[3] G11C *19/28;* H03K *17/06, 19/096*
U.S. Cl. 377—76 **5 Claims**



1. A signal translating circuit for generating plural pulse outputs in positions that are shifted time sequentially, said signal translating circuit comprising:

an input terminal supplied with an input signal;

first and second clock terminals supplied with first and second clock signals, respectively, said first and second clock signals having different phases from each other;

plural translating stages connected in series to said input terminal, each stage including

a source follower transistor having a gate, a source and a drain, said drain being connected to one of said first and second clock terminals, and a bootstrap capacitor formed between said gate and source; and

a transmission gate transistor having a gate, a source and a drain, the drain of said transmission gate transistor being connected to the source of said source follower transistor, the gate of said transmission gate transistor being connected to receive an enabling potential, and the source of said transmission gate transistor being connected to the gate of the source follower transistor of a succeeding stage;

plural output terminals where said plural pulse outputs appear, said output terminals being respectively connected to the sources of the source follower transistors;

means for connecting said first clock terminal to the drains of said source follower transistors of alternate stages and for connecting said second clock terminal to the drains of said source follower transistors of the remaining stages;

a switching device connected between each output terminal and ground and actuating means in each stage for turning on said switching device, said actuating means receiving the pulse output of the succeeding output terminal and generating a control signal in response thereto for turning on said switching device; and

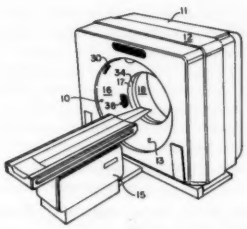
reset means in each stage for resetting said control signal, said reset means being controlled by the pulse output of the preceding output terminal.

4,538,289

REFLECTIVE ALIGNMENT LIGHT FOR COMPUTERIZED TOMOGRAPHY

Karl J. Scheibengraber, Milwaukee, Wis., assignor to General Electric Company, Milwaukee, Wis.

Filed Dec. 28, 1981, Ser. No. 335,024
Int. Cl.[3] G03B *41/16*
U.S. Cl. 378—20 **2 Claims**



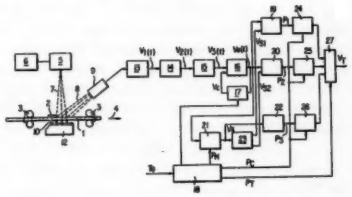
1. In a computerized tomography system having a gantry with a central opening and into which a patient can be placed for scanning, an alignment device for positioning a patient with respect to the central opening comprising: a source for projecting a beam of collimated light; and a reflective cylindrical rod disposed in such a position as to reflect said beam of collimated light in a diverging linear pattern.

4,538,290

APPARATUS FOR DETECTING AN ABNORMALITY IN PAPERLIKE MATERIAL

Yasushi Nakamura, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 969,379, Dec. 14, 1978, abandoned. This application Sep. 8, 1980, Ser. No. 184,904
Int. Cl.[3] G01M *23/22*
U.S. Cl. 378—44 **2 Claims**



1. An apparatus for examining a piece of paper having a pattern printed thereon, comprising:

means for transferring said piece of paper;

means for irradiating X-rays on said piece of paper transferred by said transferring means;

detecting means for detecting fluorescent X-rays scattered from said printed pattern on said paper;

subdividing means for subdividing said paper and the pattern located thereon into a plurality of areas;

a plurality of discriminator means each connected to said detecting means and said subdividing means for discriminating scattering characteristics of specific elements and for outputting pulses indicative of the presence of said specific elements;

a plurality of counting means corresponding to said plurality of discriminator means, each connected to said corresponding discriminator means for counting said output pulses from each of said discriminator means;

counter resetting means for resetting each of said counting means; and

means for outputting a predetermined reference signal indicative of an authentic document;

comparison logic means for comparing the counted outputs of said counting means with said predetermined output corresponding to said predetermined reference signal.

4,538,291

X-RAY SOURCE

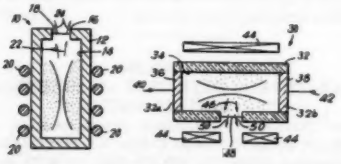
Seiichi Iwamatsu, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Nov. 2, 1982, Ser. No. 438,569

Claims priority, application Japan, Nov. 9, 1981, 56-179384; Nov. 9, 1981, 56-179385; Mar. 16, 1982, 57-41167

Int. Cl.³ H05G *1/00*; H01J *35/00*

U.S. Cl. 378—119 **14 Claims**



1. An X-ray source comprising a vessel, inert gas filling said vessel, and energizing means for causing said inert gas to enter a plasma state, said inert gas when placed in a plasma state producing X-rays, said vessel including window means for permitting said X-rays to radiate out of said vessel, said energizing means including a pair of spaced electrodes on said vessel, said electrodes, when energized, causing said inert gas to enter the plasma state, said energizing means further including coil means around said vessel for generating a magnetic field to cause said plasma to enter the pinch state so that X-rays are produced and radiated through said window means.

8. An X-ray source comprising a vessel, inert gas filling said vessel, and energizing means for causing said inert gas to enter a plasma state, a high frequency power being applied to said energizing means, said inert gas when placed in a plasma state producing X-rays, said vessel including window means for permitting said X-rays to radiate out of said vessel, said energizing means including magnetic coil means adjacent said vessel for creating a magnetic field when said high frequency power is applied thereto for causing said inert gas to enter the plasma state, said coil means being a high-frequency coil, with between substantially 100 KV and 500 KV being applied to said coil as said high-frequency power.

4,538,292

DENTAL INSTRUMENT FOR OPTIMAL POSITIONING OF AN X-RAY FILM SUPPORT

Enok S. R. Lindén, Teatergatan 34, S-582 22 Linköping, Sweden

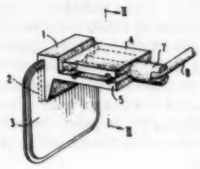
PCT No. PCT/SE82/00326, § 371 Date Jun. 14, 1983, § 102(e) Date Jun. 14, 1983, PCT Pub. No. WO83/01564, PCT Pub. Date May 11, 1983

PCT Filed Oct. 11, 1982, Ser. No. 505,035

Claims priority, application Sweden, Nov. 6, 1981, 8106601

Int. Cl.³ A61B *6/14*; A61C *19/00*; G03B *41/16*

U.S. Cl. 378—169 **6 Claims**



1. In a dental instrument for positioning of an X-ray film for X-raying of teeth or adjacent tissues, said dental instrument comprising an X-ray film support, a bite block integral with said film support and extending to one side thereof and generally perpendicular thereto to the plane of the X-ray film supported thereby, and an alignment rod coupled to said bite block for adjusting the position of the bite block relative to the film support, the improvement wherein said bite block comprises:

upper and lower flat plate portions spaced from each other, forming a gap,

one of said portions being integral with said film support extending outwardly therefrom and generally perpendicular to the plane of the X-ray film,

the other portion being generally parallel to said one portion, and

means for pivotably connecting said upper and lower plate portions at said gap for pivoting about an axis perpendicular to the plane of the X-ray film, and the plane of bite defined by the tooth rows contacting the top of the upper plate portion and the bottom of the lower plate portion of the bite block,

and wherein the plate portion of said bite block not integral with the film support, is free of said other portion except at said pivot connection therebetween, permitting the two plate portions to automatically assume such angular positions that each of them is parallel with a plane through the chewing surfaces of the adjacent tooth row to insure that once the teeth have been clamped to the bite block plate portions, the bite block and the X-ray film support are securely retained in the position selected by the dentist.

4,538,293

X-RAY FILM CASSETTE HOLDER

James W. Cutter, 85 Franks Dr., Hollister, Calif. 95023

Filed Feb. 23, 1983, Ser. No. 468,985

Int. Cl.³ H05G *1/00*

U.S. Cl. 378—181 **6 Claims**

1. An X-ray cassette holder for inserting and positioning an X-ray film cassette in an X-ray machine, said holder comprising:

a planar tray including means for inserting and positioning said tray in the X-ray machine and including:

first positioning means, coupled to said tray, for positioning the X-ray film cassette relative to said tray along a first coordinate axis;

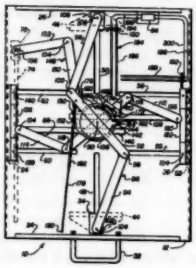
second positioning means, coupled to said tray, for positioning said cassette relative to said tray along a second coordinate axis orthogonal to said first coordinate axis;

actuator means, coupled to said machine and said second

positioning means, for enabling the positioning of said cassette by said second positioning means as said holder is inserted into said machine including:

(a) a slide for coupling said actuator means to said machine;

(b) an actuator link pivotably coupled at one end to said slide; and



(c) a crank rotatably coupled to the center of said tray and pivotably coupled to the other end of said actuator link; said slide, said actuator link and said crank forming a slider-crank mechanism that rotates said crank as said holder is inserted into and withdrawn from said machine; and

releasable coupling means for releasably coupling said actuator means to said second positioning means.

4,538,294

X-RAY FILM-HOLDING DEVICE WITH CONVEX CUSHION MEMBERS

Kaoru Tamura, Utsunomiya, and Yoshimasa Ogo, Ootawara, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Feb. 10, 1984, Ser. No. 578,884
Claims priority, application Japan, Feb. 16, 1983, 58-22805
Int. Cl.³ G03B *11/00*
U.S. Cl. 378—187 **9 Claims**

1. An X-ray film-holding device for holding an X-ray film, comprising:

a front plate and a back plate permeable to X-rays;

supporting means for supporting the front and back plates so that the two plates can be fixed in overlapping relation;

cushion members on the front and back plate sides fixed to opposite faces of the front and back plates, said front- and back-plate-side cushion members having front- and back-plate-side convex surfaces curved in first and second directions, and arranged so that the first and second directions cross each other; and

intensifying screens on the front and back plate sides fixed to and curved along the front- and back-plate-side convex surfaces,

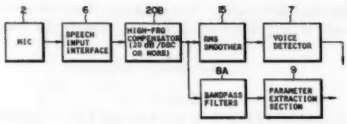
said X-ray film being held between the front- and back-plate-side intensifying screens by the elastic force of the front- and back-plate-side cushion members.

4,538,295

SPEECH RECOGNITION SYSTEM FOR AN AUTOMOTIVE VEHICLE

Kazunori Noso, Yokosuka, and Norimasa Kishi, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Aug. 16, 1982, Ser. No. 408,699
Int. Cl.³ G10L *1/00*
U.S. Cl. 381—43 **12 Claims**



1. A speech recognition system for an automotive vehicle for activating vehicle actuators in response to a spoken instruction signal received through a microphone, comprising:

(a) a voice input section including notch filter means for attenuating frequency components of the signals received through the microphone at approximately 400 Hz;

(b) voice detection means connected to said notch filter means for detecting beginning and end of spoken instruction signals and outputting instruction start and end signals for identifying, respectively, start and end of an instruction;

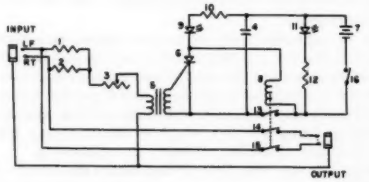
(c) a plurality of bandpass filter means connected to said notch filter means for further filtering signals filtered through said notch filter means to human speech frequency components and to noise frequency components due to noise resulting from engine operation; and (d) voice analysis means connected to said bandpass filter means and responsive to the instruction start and end signals for analyzing the signals filtered through said bandpass filter means, comparing analyzed results with predetermined reference values corresponding to at least one spoken instruction, and for activating at least one actuator when the analyzed results match predetermined reference values associated with the actuator.

4,538,296

SOUND INHIBITOR FOR AUDIO TRANSDUCERS

Robert S. Short, 24 Cornell Way, Hopatcong, N.J. 07843, and Mark S. Utter, 24 Lenape Dr., Montville, N.J. 07045

Filed Jul. 22, 1983, Ser. No. 516,040
Int. Cl.³ H02H *1/04*
U.S. Cl. 381—72 **21 Claims**



1. A protection circuit for limiting the sound pressure level provided by a transducer load but otherwise not interfering with the flow of audio signal current to said transducer load comprising:

(a) audio signal prevention means to immediately prevent audio signal current from reaching the transducer load which includes:

(i) means to sense voltage applied to the transducer load, and
(ii) means to increase said voltage, and
(iii) means to use said increased voltage when it exceeds a predetermined level to immediately prevent the audio signal current from reaching the transducer load,

(b) audio signal reestablishment means to reestablish the audio signal current to the transducer load after a fixed interval of time, and

(c) audio signal reprevention means to again prevent the audio signal current from reaching the transducer load in the event that said increased voltage still exceeds said predetermined level, and

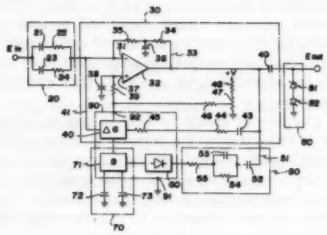
(d) repeating means to repeat the functions described in subparagraphs (b) and (c) above sequentially until said increased voltage does not exceed said predetermined level at which time said audio signal is allowed to reach the transducer load.

4,538,297

AURALLY SENSITIZED FLAT FREQUENCY RESPONSE NOISE REDUCTION COMPANSION SYSTEM

James Waller, Jr., 9901 Allen Rd., Clarkston, Mich. 48016

Filed Aug. 8, 1983, Ser. No. 521,144
Int. Cl.³ H04B *1/64*
U.S. Cl. 381—94 **14 Claims**



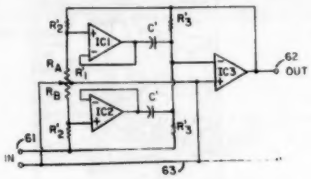
1. A flat frequency response compansion noise reduction system for an input signal comprising:
means for directly preemphasizing said input signal;
means for compressing said directly preemphasized signal;
means for inversely preemphasizing said compressed signal;
means for sensing said inversely preemphasized signal and for providing a first D.C. control signal having an amplitude that varies directly with the amplitude of said inversely preemphasized signal, said compressing means being variably responsive to said first D.C. control signal to determine the gain of said compressing means;
means for directly deemphasizing said compressed signal;
means for sensing said directly deemphasized signal and for providing a second D.C. control signal having an amplitude that varies directly with the amplitude of said directly deemphasized signal;
means for expanding said compressed signal, said expanding means being variably responsive to said second D.C. control signal to determine the gain of said expanding means; and
means for inversely deemphasizing said expanded signal,
the frequency response curve of said means for directly preemphasizing being a mirror image of the frequency response curve of said means for inversely deemphasizing,
the frequency response curve of said means for directly deemphasizing being a mirror image of the frequency response of said means for inversely preemphasizing,
the high frequency 3 db point of said means for inversely preemphasizing being within the flat frequency response range of the high frequency 3 db point of said means for directly preemphasizing, and
the high frequency 3 db point of said means for inversely deemphasizing being within the more sensitive frequency range of the human ear.

4,538,298

FIXED BANDPASS TONE CONTROLLING

Amar G. Bose, Wayland, Mass., assignor to Bose Corporation, Framingham, Mass.

Filed Sep. 29, 1982, Ser. No. 428,148
Int. Cl.³ H03G *5/00*
U.S. Cl. 381—98 **4 Claims**



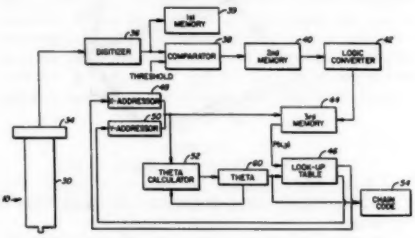
1. Fixed bandpass tone controlling apparatus comprising,
circuit means for establishing a transfer function characterized by a zero and a pole on the real axis in the complex frequency plane each spaced from the imaginary axis by a distance corresponding to an audible frequency,
and said circuit means including means for maintaining one of said pole and said zero fixed on said real axis while selectively moving the other along said real axis between a first position near the stationary one of said pole and said zero and a second position away from said stationary one of said pole and zero,
wherein said first position corresponds to that of said stationary one of said zero and said pole at substantially 1,000 Hz and said second position is always further from the center frequency of the audible spectrum corresponding substantially to 800 Hz than said first position.

4,538,299

METHOD AND APPARATUS FOR LOCATING THE BOUNDARY OF AN OBJECT

Sherman E. DeForest, Del Mar, Calif., assignor to International Remote Imaging Systems, Inc., Chatsworth, Calif.

Continuation-in-part of Ser. No. 327,368, Dec. 4, 1981, abandoned. This application Feb. 28, 1983, Ser. No. 470,208
Int. Cl.³ G06K *9/48*
U.S. Cl. 382—21 **16 Claims**



1. An apparatus for automatically locating the boundary of an object in a field of view, said apparatus comprising:
imaging means for forming an electrical image of the field of view;
means for forming a first representation of said image by segmenting said image into a plurality of pixels and digitizing the image intensity of each pixel into an electrical signal representing the greyscale value;
means for processing the electrical signal of each of said greyscale value to form a second representation of said image;

logic means for converting said second representation into a third representation whereby the value of a pixel at a location (hereinafter: pixel (X,Y)) in the second representation and the values of the nearest adjacent neighbors of said pixel at said location are converted into a single value at said corresponding location (hereinafter: P(X,Y)) in said third representation;

storage means for storing said third representation; and

table means for storing various possible values of P(X,Y), said table means for receiving a value of P(X,Y) and an input direction value, and for producing an output direction value to indicate the next location of P(X,Y) having a non-zero value; said non-zero values of P(X,Y) form the boundary of said object.

4,538,300

LINEAR SIGNAL STRENGTH DETECTOR IN AM RADIO

Oliver L. Richards, Jr., Windham, Conn., assignor to Sprague Electric Company, North Adams, Mass.

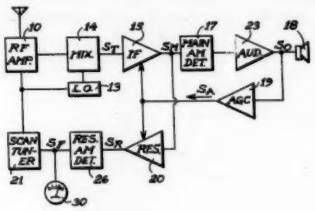
Filed Sep. 7, 1983, Ser. No. 530,131

Int. Cl.[3] H03J *7/18;* H04B *1/16*

U.S. Cl. 455—161 **7 Claims**

1. In a radio receiver of the kind that is capable of operating in an analog-gain mode and that includes a plurality of tandem-connected analog-amplifier stages for processing and amplifying a radio signal which may be applied to the input of said tandem stages, and an AGC circuit for automatically altering the gain of at least one of said stages to maintain the output signal from said stages substantially constant for a wide range of amplitudes of said radio signal, the gain of said tandem stages as a function of the output signal from said AGC circuit being a transfer function, f_2, the improvement comprising:

a restorer means having a radio-signal input connected to said output of said tandem stages, said restorer means



having an electrically gain-alterable transfer function f_1 between said radio-signal input and output thereof and having a control input connected to the output of said AGC circuit, for making the product of said transfer functions f_1 and f_2 a constant over a wide range of amplitudes of said radio signal.

DESIGNS

AUGUST 27, 1985

280,250
THIGH PROTECTOR
Eugene J. Vacanti, Edina, Minn., assignor to Sports Marketing, Inc., Eden Prairie, Minn.
Filed Aug. 17, 1982, Ser. No. 408,881
Term of patent 14 years
U.S. Cl. D2—27

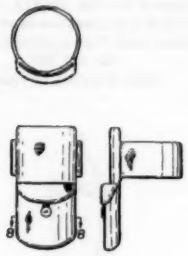
280,251
CONVERTIBLE JEANS
Gloria J. Forbes, Aschman La., Croton on Hudson, N.Y. 10520
Filed May 20, 1983, Ser. No. 496,810
Term of patent 14 years
U.S. Cl. D2—28

280,252
SWIMWEAR
Jacquelyn A. Briggery Myles, 1427 Newton Ave., Dayton, Ohio 45406
Continuation-in-part of Ser. No. 374,912, May 4, 1982, Pat. No. Des. 275,810, which is a continuation-in-part of Ser. No. 86,477, Oct. 19, 1979, abandoned. This application Sep. 30, 1982, Ser. No. 431,750
Term of patent 14 years
U.S. Cl. D2—40

280,253
MALE FORMAL-WEAR COAT
Cal R. Williams, 6124 NE. 11th Ave., Portland, Oreg. 97211
Filed Apr. 29, 1983, Ser. No. 490,038
Term of patent 14 years
U.S. Cl. D2—187

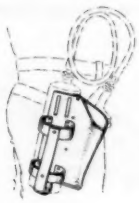
280,254
SANDAL
Guadalupe Carvajal Pavon, Torrejon de Ardoz Optica St., 6, Madrid, Spain
Filed Jan. 10, 1983, Ser. No. 457,262
Term of patent 14 years
U.S. Cl. D2—283

280,255
ARMBAND POUCH
Marilyn Blaivas, 104 Dunwoody La., Hollywood, Fla. 33021
Filed Feb. 22, 1983, Ser. No. 468,757
Term of patent 14 years
U.S. Cl. D2—383

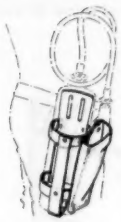


280,256
BATON CARRIER FOR USE WITH BELT
Leslie D. Miller, 2377 N. Plain City Rd., Ogden, Utah 84404
Filed Sep. 14, 1983, Ser. No. 532,219
Term of patent 14 years
U.S. Cl. D2—400

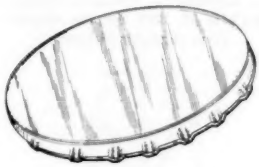
280,257
CARRIER FOR A GAS TORCH AND FUEL TANK
Benson L. Miller, Lexington, Ky., assignor to Ignitor Products International, Inc., Nicholasville, Ky.
Filed Nov. 1, 1983, Ser. No. 548,142
Term of patent 14 years
U.S. Cl. D2—400



280,258
CARRIER FOR GAS TORCH AND FUEL TANK
Benson L. Miller, Lexington, Ky., assignor to Ignitor Products International, Inc., Nicholasville, Ky.
Filed Nov. 1, 1983, Ser. No. 548,143
Term of patent 14 years
U.S. Cl. D2—400



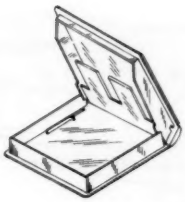
280,259
SEAT CUSHION
Robert S. Scheurer, and Stephen Scheurer, both of P.O. Box 539, Wichita Falls, Tex. 76307
Filed Apr. 20, 1983, Ser. No. 486,913
Term of patent 14 years
U.S. Cl. D6—596



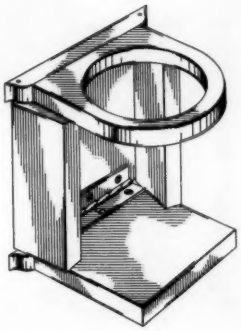
280,260
CARRYING CASE
Steven G. Leiserson, 9190 Manor Dr., La Mesa, Calif. 92041
Filed Aug. 16, 1982, Ser. No. 408,293
Term of patent 14 years
U.S. Cl. D3—33

280,261
CARRYING CASE FOR SUNGLASSES OR THE LIKE
David P. Chuboff, North Barrington; Francis J. Greb, Buffalo Grove, both of Ill., and Aaron M. Markovitz, Rochester, N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.
Filed Dec. 30, 1982, Ser. No. 454,830
Term of patent 14 years
U.S. Cl. D3—34

280,262
MAGNETIC MEMORY STORAGE CONTAINER
Robert A. Egly, 38 Whitewater Dr., Corona del Mar, Calif. 92625, and Patrick Sullivan, Tustin, Calif., assignors to Robert A. Egly, Corona del Mar, Calif.
Filed Sep. 13, 1982, Ser. No. 417,108
Term of patent 14 years
U.S. Cl. D3—35

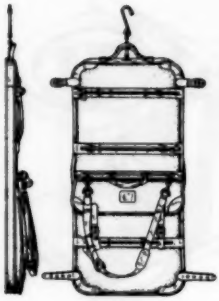


280,263
BEVERAGE HOLDER FOR BOATS
Thomas M. Hoye, 6850 N. 86th St., Scottsdale, Ariz. 85253
Filed May 27, 1983, Ser. No. 498,814
Term of patent 14 years
U.S. Cl. D3—40

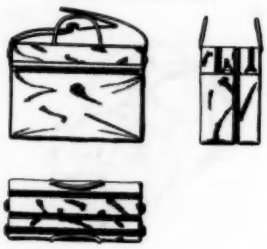


280,264
CARRYALL FOR SLEEPING BAG AND ACCESSORIES
Robert J. Lipsig, Chicago, Ill., assignor to Ero Industries, Inc., Chicago, Ill.
Filed Mar. 7, 1983, Ser. No. 473,118
Term of patent 14 years
U.S. Cl. D3—48

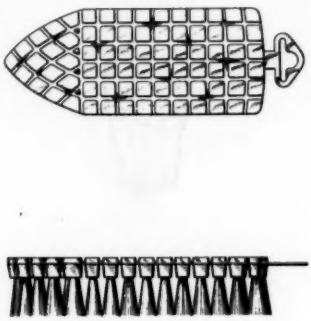
280,265
GARMENT BAG
Richard B. Gibbs, 11548 Thurston Cir., Los Angeles, Calif. 90049
Filed Jul. 8, 1983, Ser. No. 511,951
Term of patent 14 years
U.S. Cl. D3—71



280,266
COMBINED BRIEFCASE AND OVERNIGHT CASE
James H. Allen, Covington, Ky., assignor to 'Totes', incorporated, Loveland, Ohio
Filed Apr. 18, 1983, Ser. No. 486,056
Term of patent 14 years
U.S. Cl. D3—71

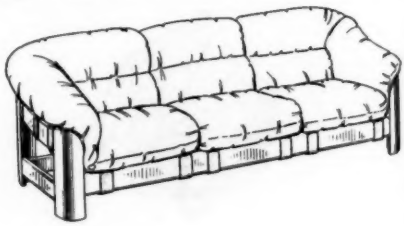


280,267
FLEXIBLY-BACKED BRUSH
William C. Bryant, Bell Arthur, and William C. Ferguson, Raleigh, both of N.C., assignors to Empire Brushes, Inc., Greenville, N.C.
Filed Aug. 27, 1984, Ser. No. 644,439
Term of patent 14 years
U.S. Cl. D4—130



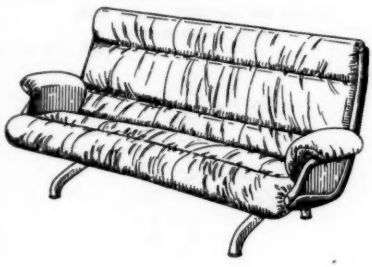
280,268
HAIRBRUSH OR THE LIKE
Janice L. Schmidt, Providence, R.I., assignor to Dart Industries Inc., Northbrook, Ill.
Filed Feb. 1, 1983, Ser. No. 462,828
Term of patent 14 years
U.S. Cl. D4—136

280,269
SOFA
David P. G. Williams, Englewood, N.J., assignor to Chairmakers, Inc., City of Commerce, Calif.
Filed Apr. 27, 1983, Ser. No. 489,093
Term of patent 14 years
U.S. Cl. D6—379

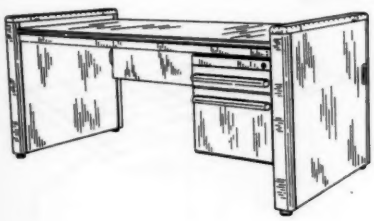


280,270
CHAIR
Yasuhiro Okuda, 310 E. 46th St., New York, N.Y. 10017
Filed Jun. 15, 1983, Ser. No. 504,360
Term of patent 14 years
U.S. Cl. D6—380

280,271
SOFA
Warren Platner, Foote's Bridge Rd., Guilford, Conn. 06437
Filed Jan. 3, 1983, Ser. No. 455,230
Term of patent 14 years
U.S. Cl. D6—381

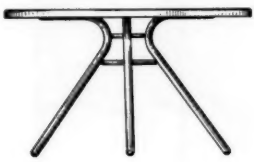


280,272
DESKS
Ettore Sottsass, and Michele De Lucchi, both of Milan, Italy, assignors to Olivetti Synthesis, S.p.A., Turin, Italy
Filed Jan. 10, 1983, Ser. No. 456,772
Claims priority, application Italy, Jul. 8, 1982, 53489/82 [U]
Term of patent 14 years
U.S. Cl. D6—422



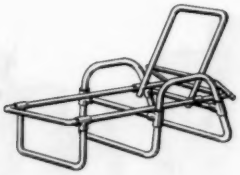
280,273
STEP TUBE TABLE
Paul R. Goldman, 8 Joyce Ter., Andover, Mass. 01810
Filed Sep. 28, 1982, Ser. No. 425,557
Term of patent 14 years
U.S. Cl. D6—474

280,274
TABLE
Eugene A. Criqui, Covina, and Peter W. Homestead, San Clemente, both of Calif., assignors to Brown Jordan Company, El Monte, Calif.
Filed Apr. 15, 1983, Ser. No. 485,555
Term of patent 14 years
U.S. Cl. D6—487

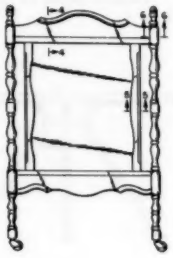


280,275
TABLE
Eugene A. Criqui, Covina, and Peter W. Homestead, San Clemente, both of Calif., assignors to Brown Jordan Company, El Monte, Calif.
Filed Apr. 18, 1983, Ser. No. 485,698
Term of patent 14 years
U.S. Cl. D6—487

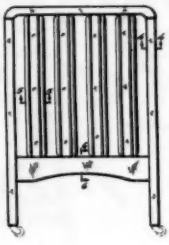
280,276
LOUNGE CHAIR FRAME
Stewart K. McKay, P.O. Box 5022, Gold Coast Mail Centre, Queensland, 4217, Australia
Filed Dec. 20, 1982, Ser. No. 451,347
Term of patent 14 years
U.S. Cl. D6—501



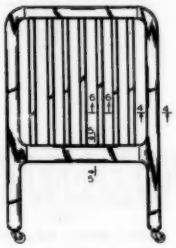
280,277
CRIB FOOTBOARD
Merlin A. Brunner; David W. Robinson, both of New London, and Harvey J. Draheim, Weyauwega, all of Wis., assignors to Simmons Universal Corporation, New York, N.Y.
Filed Jun. 24, 1983, Ser. No. 507,893
Term of patent 14 years
U.S. Cl. D6—505



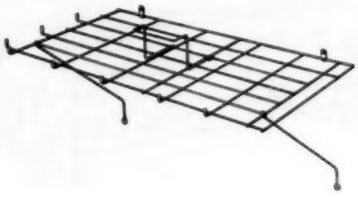
280,278
CRIB FOOTBOARD
Merlin A. Brunner; David W. Robinson, both of New London, and Harvey J. Draheim, Weyauwega, all of Wis., assignors to Simmons Universal Corporation, New York, N.Y.
Filed Jun. 9, 1983, Ser. No. 502,795
Term of patent 14 years
U.S. Cl. D6—508



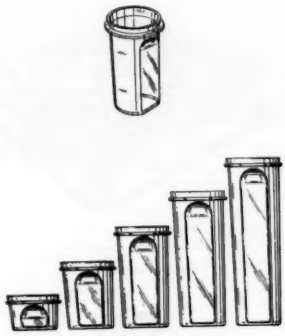
280,279
CRIB FOOTBOARD
Merlin A. Brunner; David W. Robinson, both of New London, and Harvey J. Draheim, Weyauwega, all of Wis., assignors to Simmons Universal Corporation, New York, N.Y.
Filed Jun. 9, 1983, Ser. No. 502,796
Term of patent 14 years
U.S. Cl. D6—508



280,280
POWER TOOL HOLDER
William J. Pestone, Scituate, Mass., assignor to Crawford Products, Inc., West Hanover, Mass.
Filed Mar. 18, 1983, Ser. No. 476,840
Term of patent 14 years
U.S. Cl. D6—566



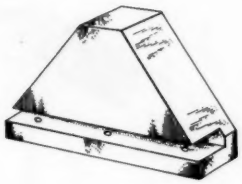
280,281
FOOD STORAGE CONTAINER OR THE LIKE
Rino Conti, Stoughton, Mass., and Robert H. C. M. Daenen, Hekelgem, Belgium, assignors to Dart Industries Inc., Northbrook, Ill.
Filed Aug. 10, 1982, Ser. No. 406,844
Term of patent 14 years
U.S. Cl. D7—79



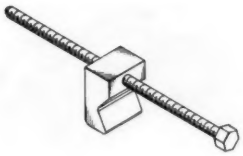
280,282
WIRE COOKING RACK
Arthur R. Erbach, Des Plaines, Ill., assignor to Weber-Stephen Products Co., Palatine, Ill.
Filed Jun. 6, 1983, Ser. No. 501,090
Term of patent 14 years
U.S. Cl. D7—404

280,283
SCISSORS
Tamoru Asano, Gifu, Japan, assignor to Kai Jirushi Hamano Center, Gifu, Japan
Filed Mar. 12, 1982, Ser. No. 357,477
Claims priority, application Japan, Sep. 14, 1981, 56-40392
Term of patent 14 years
U.S. Cl. D8—57

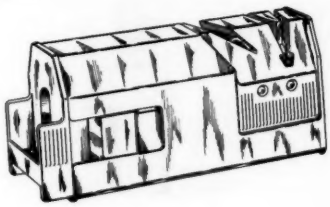
280,284
FILE HOLDER
Walfred R. Bachmann, 28 Main St., Ashburnham, Mass. 01430
Filed Apr. 7, 1983, Ser. No. 482,915
Term of patent 14 years
U.S. Cl. D8—71



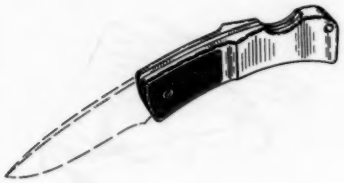
280,285
WHEEL ALIGNMENT TOOL OR SIMILAR ARTICLE
Ronnie R. Miller, Rte. 3 Box 985, and Michael W. Rogers, 701 Crotty, both of Rockwall, Tex. 75087
Filed Apr. 28, 1983, Ser. No. 489,472
Term of patent 14 years
U.S. Cl. D8—72



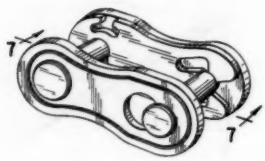
280,286
KNIFE SHARPENER
Jan F. Van Asten, Leek, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Dec. 12, 1983, Ser. No. 560,701
Claims priority, application Benelux, Jun. 29, 1983, 58015-00
Term of patent 14 years
U.S. Cl. D8—93



280,287
HANDLE FOR FOLDING POCKET KNIFE
Walter W. Collins, 802 Bellwood St., Clover, S.C. 29710
Filed Mar. 14, 1983, Ser. No. 474,833
Term of patent 14 years
U.S. Cl. D8—99

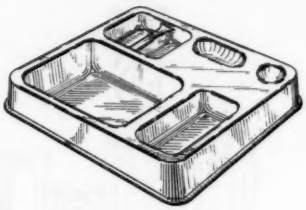


280,288
CHAIN LINK
Robert J. Lickton, 310 Lake, Oak Park, Ill. 60302
Filed May 9, 1983, Ser. No. 492,618
Term of patent 14 years
U.S. Cl. D8—499



280,289
BOTTLE
Thomas B. Aldrich, III, Spring Valley, N.Y., and Ralph A. Muscatiello, Norwood, Mass., assignors to The Gillette Company, Boston, Mass.
Filed May 12, 1983, Ser. No. 493,788
Term of patent 14 years
U.S. Cl. D9—338

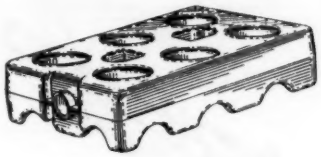
280,290
COMBINED PACKAGING AND MIXING CONTAINER
Steven L. Bakus, Vernon Hills, Ill., assignor to Felt Products Mfg. Co., Skokie, Ill.
Filed Mar. 4, 1983, Ser. No. 472,081
Term of patent 14 years
U.S. Cl. D9—347



280,291
BOTTLE
Joan C. Copsey; John J. McNamara, Jr., both of Elkhart, Ind., and Jeremy L. Parker, Lancaster, Pa., assignors to Miles Laboratories, Inc., Elkhart, Ind.
Filed Jan. 13, 1983, Ser. No. 457,710
Term of patent 14 years
U.S. Cl. D9—349

280,292
BOTTLE
Timothy J. Beechuk, Batavia; Max E. Damron, and Ralph B. Vanderman, both of Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed May 5, 1983, Ser. No. 491,635
Term of patent 14 years
U.S. Cl. D9—355

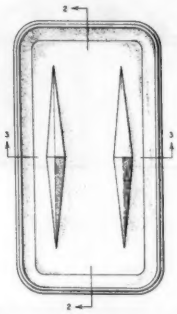
280,293
BOTTLE COOLER
Richard D'Amour, 1625 des Merisiers, Cote Ste. Catherine, Quebec, Canada (J0L 1E0), and Ronald D'Amour, 5 Belanger, St. Constant, Quebec, Canada (J0L 1X0)
Filed Feb. 14, 1984, Ser. No. 580,009
Term of patent 14 years
U.S. Cl. D9—373



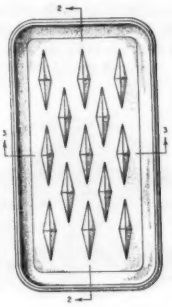
280,294
PERFUME BOTTLE
Lynda R. Resnick, Beverly Hills, Calif., assignor to Teleflora, Inc., Los Angeles, Calif.
Filed Apr. 13, 1983, Ser. No. 484,479
Term of patent 14 years
U.S. Cl. D9—385

280,295
FLASK
Jean de Mouy, Biarritz, and Alain Carre, Tours, both of France, assignors to SOFIPAR International Inc., New York, N.Y.
Filed Jan. 5, 1982, Ser. No. 337,183
Claims priority, application France, Jul. 15, 1981, 81 2492
Term of patent 14 years
U.S. Cl. D9—408

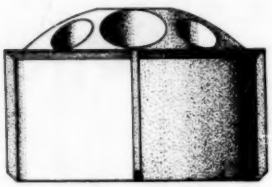
280,296
PACKAGING TRAY
M. James Holden, Canandaigua, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.
Filed Jun. 9, 1983, Ser. No. 502,437
Term of patent 14 years
U.S. Cl. D9—425



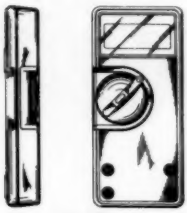
280,297
PACKAGING TRAY
M. James Holden, Canandaigua, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.
Filed Jun. 9, 1983, Ser. No. 502,438
Term of patent 14 years
U.S. Cl. D9—425



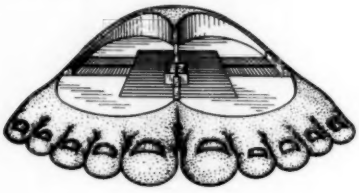
280,298
SOLID PRODUCT ELEVATOR CUP
Carl W. Hafer, and Eric S. Schwoeppe, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Feb. 14, 1983, Ser. No. 465,949
Term of patent 14 years
U.S. Cl. D9—434



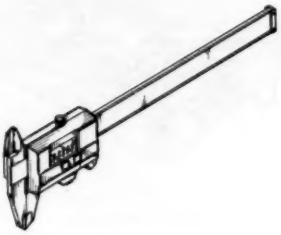
280,299
DIGITAL MULTIMETER FOR ELECTRICAL MEASUREMENT
Michael D. Nelson, Seattle, Wash., assignor to John Fluke Mfg. Co., Inc., Everett, Wash.
Filed Feb. 7, 1983, Ser. No. 464,670
Term of patent 14 years
U.S. Cl. D10—40



280,300
MEASURING DEVICE FOR CHILDREN'S FEET
Bernard Short, 185 Elliot St., Chestnut Hill, Mass. 02167
Filed Jun. 17, 1983, Ser. No. 505,436
Term of patent 14 years
U.S. Cl. D10—71

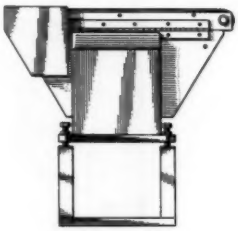


280,301
CALIPER
Shingo Nishina, Kawasaki, and Takashi Kobashi, Utsunomiya, both of Japan, assignors to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan
Filed Apr. 15, 1983, Ser. No. 485,543
Claims priority, application Japan, Oct. 27, 1982, 57-48811
Term of patent 14 years
U.S. Cl. D10—73

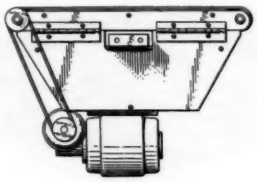


280,302
LEVEL VIAL HOLDER
James L. Clark, Milwaukee, Wis., assignor to Johnson Level & Tool Mfg. Co., Inc., Milwaukee, Wis.
Filed Jun. 20, 1983, Ser. No. 505,867
Term of patent 14 years
U.S. Cl. D10—74

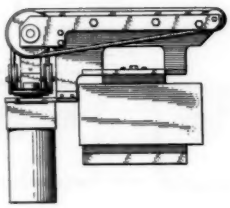
280,303
POWERED PLATFORM SCALE
Victor Del Rosso, Ithaca, N.Y., assignor to Hi-Speed Checkweigher Co., Inc., Ithaca, N.Y.
Filed Oct. 19, 1983, Ser. No. 543,330
Term of patent 14 years
U.S. Cl. D10—87



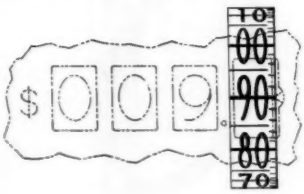
280,304
POWERED PLATFORM SCALE
Victor Del Rosso, Ithaca, N.Y., assignor to Hi-Speed Checkweigher Co., Inc., Ithaca, N.Y.
Filed Oct. 19, 1983, Ser. No. 543,349
Term of patent 14 years
U.S. Cl. D10—87



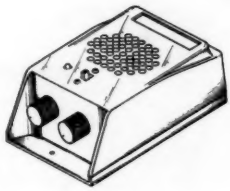
280,305
POWERED PLATFORM SCALE
Victor Del Rosso, Ithaca, N.Y., assignor to Hi-Speed Checkweigher Co., Inc., Ithaca, N.Y.
Filed Oct. 19, 1983, Ser. No. 543,350
Term of patent 14 years
U.S. Cl. D10—87



280,306
COUNTER WHEEL INDICIA RIM
Bruno S. Smilgys, Hartford, Conn., assignor to Veeder Industries Inc., Hartford, Conn.
Filed Jan. 18, 1982, Ser. No. 340,509
Term of patent 14 years
U.S. Cl. D10—103

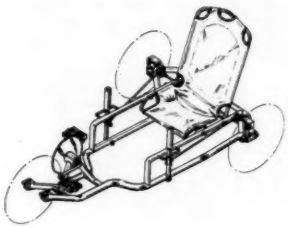


280,307
AUTOMOBILE ALARM
Terry T. Kunimune, 6058 San Fernando Rd., Glendale, Calif. 91202
Filed Jul. 25, 1983, Ser. No. 517,217
Term of patent 14 years
U.S. Cl. D10—106

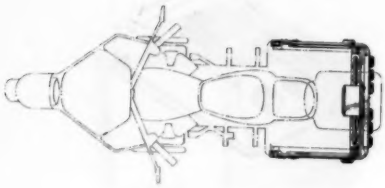


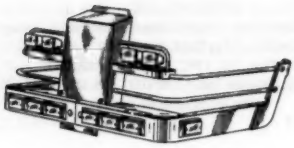
280,308
TOBOGGAN
Raymond A. Cashmere, Charlestown, Australia, assignor to Luckit Pty. Limited, Mayfield, Australia
Filed Dec. 10, 1982, Ser. No. 448,770
Claims priority, application Australia, Jun. 30, 1982, 0819/82
Term of patent 14 years
U.S. Cl. D12—11

280,309
RECUMBENT TRICYCLE BODY
Robert C. Forbes, Sun Valley, Calif., and John VanderKam, Dayton, Ohio, assignors to Huffy Corporation, Miamisburg, Ohio
Filed Jan. 31, 1983, Ser. No. 462,488
Term of patent 14 years
U.S. Cl. D12—112

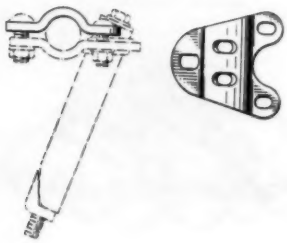


280,310
COMBINED MOTORCYCLE TRIM RAIL AND LIGHTING UNIT
James M. Preisler, Mound, and Alwin J. Stahel, St. Paul, both of Minn., assignors to Drag Specialties, Inc., Minnetonka, Minn.
Filed May 23, 1983, Ser. No. 496,839
Term of patent 14 years
U.S. Cl. D12—114

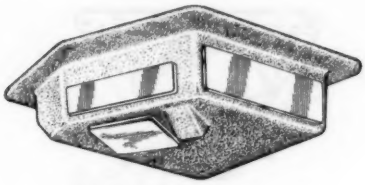




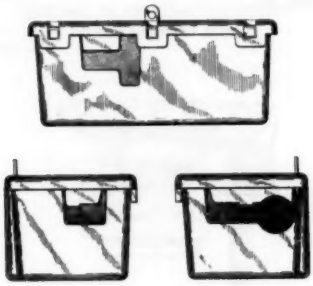
280,311
BICYCLE HANDLEBAR MOUNTING PLATE
Dennis P. Pawsat, Maysville, Ky., assignor to Wald Manufacturing Co., Inc., Maysville, Ky.
Continuation of Ser. No. 341,316, Jan. 21, 1982, abandoned. This application May 16, 1984, Ser. No. 610,887
Term of patent 14 years
U.S. Cl. D12—117



280,312
OVERHEAD CONSOLE FOR A VAN
Albert R. Simeri, and Paul S. Simeri, both of Elkart, Ind., assignors to Van Express, Inc., Elkhart, Ind.
Filed Apr. 18, 1983, Ser. No. 485,701
Term of patent 14 years
U.S. Cl. D12—155

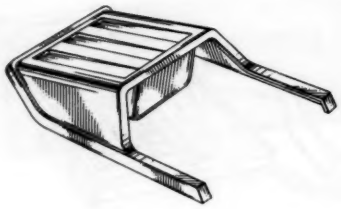


280,313
PROTECTIVE CONTAINER FOR A VEHICLE JACK
Kenneth W. Jackson, Fort Collins; James Simon, and Robert Simon, both of Loveland, all of Colo., assignors to Carry-It, Inc., Fort Collins, Colo.
Filed Apr. 11, 1983, Ser. No. 483,749
Term of patent 14 years
U.S. Cl. D12—157



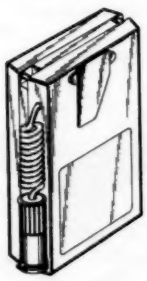
280,314
STEERING WHEEL COVER
Murray Strongwater, 326 Hewlett Neck Rd., Woodmere, N.Y. 11598
Filed Feb. 22, 1983, Ser. No. 468,160
Term of patent 14 years
U.S. Cl. D12—177

280,315
MOTORCYCLE LUGGAGE CARRIER
Mark T. Druecker, Glendale, and Ty S. Bowers, Phoenix, both of Ariz., assignors to Daystar, Inc., Glendale, Ariz.
Filed Mar. 31, 1983, Ser. No. 480,904
Term of patent 14 years
U.S. Cl. D12—158

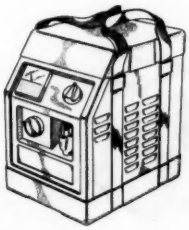


280,316
ANCHOR FOR SMALL BOATS
David S. Gooden, 6144 S. Fulton, Tulsa, Okla. 74136
Filed Apr. 4, 1983, Ser. No. 481,668
Term of patent 14 years
U.S. Cl. D12—215

280,317
RECHARGABLE BATTERY PACK
Jeffrey A. Boyd; Vincent J. Pusateri, both of Gainesville; John Hooke, High Springs, and Danny F. Rockett, Alachua, all of Fla., assignors to General Electric Company, Gainesville, Fla.
Filed Jan. 17, 1983, Ser. No. 459,005
Term of patent 14 years
U.S. Cl. D13—5



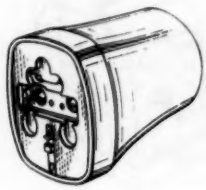
280,318
PORTABLE ELECTRIC POWER SUPPLY
Sam A. Barone, 1205 Ryson, Wheaton, Ill. 60187
Filed May 2, 1983, Ser. No. 490,426
Term of patent 14 years
U.S. Cl. D13—11



280,319
STAGGERED-FIN HEAT SINK FOR ELECTRICAL DEVICES
Alfred F. McCarthy, Belmount, N.H., assignor to Aavid Engineering, Inc., Laconia, N.H.
Filed Jul. 29, 1983, Ser. No. 518,739
Term of patent 14 years
U.S. Cl. D13—23

280,320
TWISTED-FIN HEAT SINK FOR ELECTRICAL DEVICES
Alfred F. McCarthy, Belmount, N.H., assignor to Aavid Engineering, Inc., Laconia, N.H.
Filed Jul. 29, 1983, Ser. No. 518,741
Term of patent 14 years
U.S. Cl. D13—23

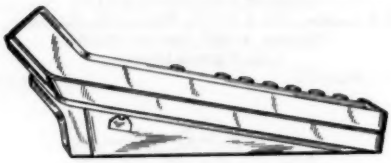
280,321
ELECTRICAL CONNECTOR
Clive St. J. Rumble, 51 Hays Mews, London, England (W1X 5DB)
Filed Aug. 9, 1983, Ser. No. 521,568
Claims priority, application United Kingdom, Jun. 21, 1983, 1013688
Term of patent 14 years
U.S. Cl. D13—24



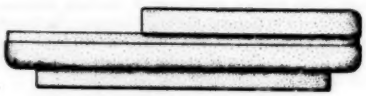
280,322
VIDEOGAME CARTRIDGE CASE
Ira L. Velinsky, Plainfield, N.J., assignor to Commodore Business Machines, Inc., West Chester, Pa.
Filed Apr. 4, 1983, Ser. No. 481,872
Term of patent 14 years
U.S. Cl. D14—11

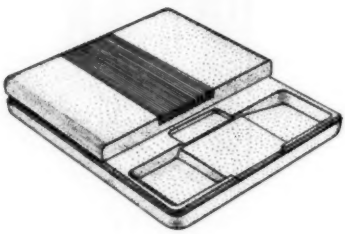
280,323
MICROPHONE OR SIMILAR ARTICLE
William J. Scheid, Coral Springs; Richard J. Toth, Boca Raton, both of Fla., and James W. Brinkerhoff, Cheyenne, Wyo., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Jun. 13, 1983, Ser. No. 503,993
Term of patent 14 years
U.S. Cl. D14—12

280,324
COMBINATION TELEPHONE HANDSET AND CONSOLE STAND ASSEMBLY
Evert Endt, Paris, France, assignor to Horlogerie Photographique Francaise, Bonneville, France
Filed Apr. 11, 1983, Ser. No. 483,561
Claims priority, application France, Oct. 13, 1982, 823494
Term of patent 14 years
U.S. Cl. D14—53

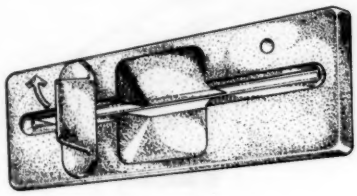


280,325
TELEPHONE STAND FOR A HANDSET
Richard M. Joffe, Palisades Park, N.J., and John N. McGarvey, Drexel Hill, Pa., assignors to AT&T Technologies, Inc., Berkeley Heights, N.J.
Filed Oct. 9, 1984, Ser. No. 658,858
Term of patent 14 years
U.S. Cl. D14—60

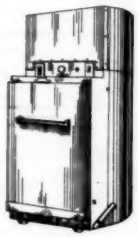




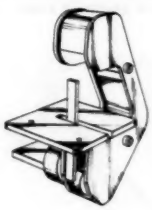
280,326
DISK DRIVE FRONT PANEL
James B. Jordan, Berkeley, Calif., assignor to Qume Corporation, San Jose, Calif.
Filed Apr. 12, 1983, Ser. No. 484,136
Term of patent 14 years
U.S. Cl. D14—115



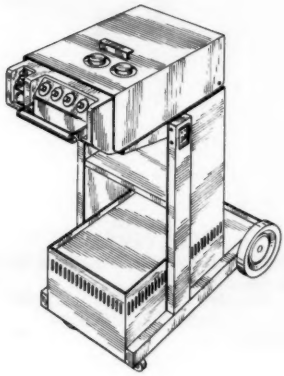
280,327
MATERIAL COMPACTOR
Robert A. Wilson, Litchfield, Ill., assignor to Waste Compaction Systems, Inc., St. Louis, Mo.
Filed Jun. 13, 1983, Ser. No. 503,784
Term of patent 14 years
U.S. Cl. D15—123



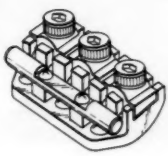
280,328
HOUSING FOR SANDERS, GRINDERS OR THE LIKE
Louis Zampini, Jr., 37 Conifer Dr., North Providence, R.I. 02904
Filed Feb. 7, 1983, Ser. No. 464,155
Term of patent 14 years
U.S. Cl. D15—124



280,329
WELDING MACHINE
Mark H. Bouman, Burnsville, Minn., assignor to Century Mfg. Co., Minneapolis, Minn.
Filed Jul. 25, 1983, Ser. No. 516,522
Term of patent 14 years
U.S. Cl. D15—144

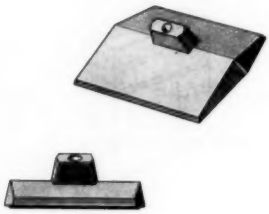


280,330
ELECTRIC GUITAR STRING LOCKING DEVICE
Yuji Tanaka, Akishima, and Hideo Matsumoto, Shizuoka, both of Japan, assignors to Tokai Gakki Co., Ltd., Japan
Filed Mar. 23, 1983, Ser. No. 478,152
Claims priority, application Japan, Dec. 31, 1982, 57-58620
Term of patent 14 years
U.S. Cl. D17—20

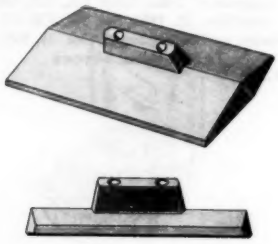


280,331
RUBBER STAMP
Susan Newman, 11 Irongate, Metuchen, N.J. 08840
Filed Feb. 22, 1983, Ser. No. 468,864
Term of patent 14 years
U.S. Cl. D18—16

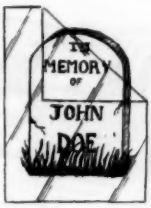
280,332
DESK PEN BASE
Nolan K. Rhoades, Beloit, Wis., assignor to The Parker Pen Company, Janesville, Wis.
Filed Jul. 14, 1983, Ser. No. 513,676
Term of patent 14 years
U.S. Cl. D19—84



280,333
DESK PEN BASE
Nolan K. Rhoades, Beloit, Wis., assignor to The Parker Pen Company, Janesville, Wis.
Filed Jul. 14, 1983, Ser. No. 513,612
Term of patent 14 years
U.S. Cl. D19—85

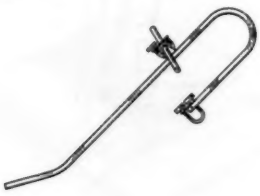


280,334
COMBINED DECAL AND PROTECTIVE COVER SHEET
David K. Halbritter, 7101 Argentine Rd., Howell, Mich. 48843
Filed Feb. 16, 1982, Ser. No. 348,991
Term of patent 14 years
U.S. Cl. D20—11

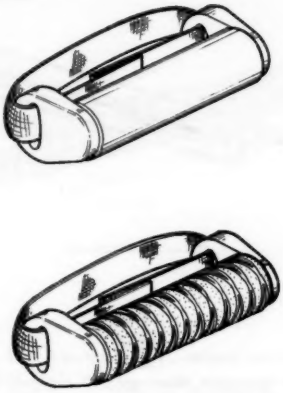


280,335
TOY TRANSPORTATION VEHICLE
Richard W. Dummar, 9826 Belmont St., Bellflower, Calif. 90706
Filed Oct. 14, 1983, Ser. No. 541,893
Term of patent 14 years
U.S. Cl. D21—87

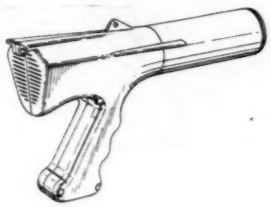
280,336
ARM EXERCISING ATTACHMENT FOR AN EXERCISING BICYCLE
David Webb, 30 Berkley Crescent, London, Ontario, Canada M6A 4B6
Filed Aug. 31, 1983, Ser. No. 528,345
Claims priority, application Canada, Jul. 13, 1983, 13-07-83-8
Term of patent 14 years
U.S. Cl. D21—191



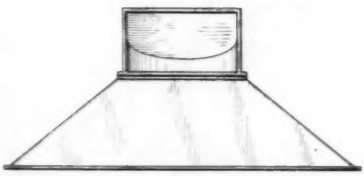
280,337
RUNNER'S HAND GRIP
J. Vincent Hood, 3810 N. Main St., #9, Racine, Wis. 53403
Filed Jul. 16, 1984, Ser. No. 631,122
Term of patent 14 years
U.S. Cl. D21—198



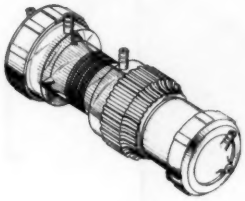
280,338
HOT AIR BLOWER
Stephen R. Skarsten, Welwyn, England, assignor to Skilten Electronics Limited, Welwyn, England
Filed Aug. 17, 1982, Ser. No. 409,043
Claims priority, application United Kingdom, Feb. 12, 1982, 1005093
Term of patent 14 years
U.S. Cl. D23—77



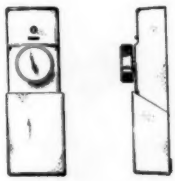
280,339
BOOSTER FAN AND DEFLECTOR FOR FLOOR VENT
Betty L. Harwell, 9643 E. 26th St., Tulsa, Okla. 74129
Filed Jan. 7, 1983, Ser. No. 456,419
Term of patent 14 years
U.S. Cl. D23—155



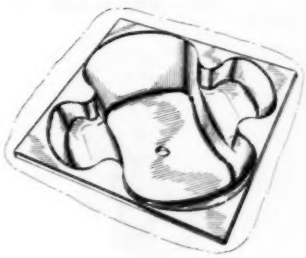
280,340
ARTIFICIAL LUNG WITH A BUILT-IN HEAT EXCHANGER
Masaru Wada, Wako, Japan, assignor to Terumo Corporation, Tokyo, Japan
Filed Dec. 17, 1982, Ser. No. 450,740
Term of patent 14 years
U.S. Cl. D24—8



280,341
MUSCLE STIMULATOR
Floyd L. Carlisle, Clinton, Conn., assignor to Theratronics, Inc., Essex, Conn.
Filed Jun. 25, 1982, Ser. No. 392,072
Term of patent 14 years
U.S. Cl. D24—36

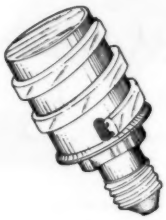


280,342
HYDROTHERAPY SPA OR THE LIKE
Herbert V. Kohler, Jr., Kohler, Wis., assignor to Kohler Co., Kohler, Wis.
Filed Jul. 18, 1983, Ser. No. 514,487
Term of patent 14 years
U.S. Cl. D24—38



280,343
PAVILION
Moses R. Schultz, Barto, Pa., assignor to Knoll International, Inc., New York, N.Y.
Filed Jan. 12, 1983, Ser. No. 457,404
Term of patent 14 years
U.S. Cl. D25—56

280,344
FLUORESCENT LAMP OR THE LIKE
John W. Anderson, Jr., Ipswich, and William J. Roche, Merrimac, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.
Filed Oct. 3, 1983, Ser. No. 538,406
Term of patent 14 years
U.S. Cl. D26—3



280,345
FLUORESCENT LAMP OR THE LIKE
Fredrick W. Paget, Rockport, Mass., assignor to GTE Products Corporation, Stamford, Conn.
Filed Dec. 1, 1983, Ser. No. 556,788
Term of patent 14 years
U.S. Cl. D26—3

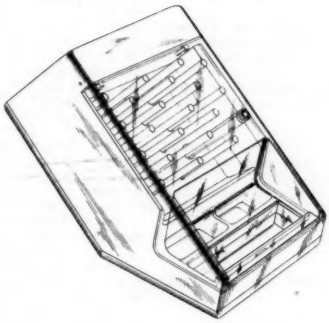
280,346
FLUORESCENT LAMP HOLDER
John E. Aspenwall, 1327 E. Madrid Way, Sandy, Utah 84092
Filed Jan. 27, 1983, Ser. No. 461,392
Term of patent 14 years
U.S. Cl. D26—75

280,347
LAMP
Matthew A. Moustakas, Warrington, Pa., assignor to Touch-On Incorporated, Philadelphia, Pa.
Filed Feb. 14, 1983, Ser. No. 466,214
Term of patent 14 years
U.S. Cl. D26—93

280,348
LAMP BASE
Emanuel M. Pupulidy, 503 Valasquez Dr., Osprey, Fla. 33559
Filed Mar. 21, 1983, Ser. No. 477,229
Term of patent 14 years
U.S. Cl. D26—140

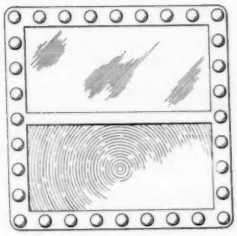
280,349
REVERSIBLE COMB OR THE LIKE
Joan K. Creamer, East Greenwich, R.I., assignor to Dart Industries Inc., Northbrook, Ill.
Filed Feb. 1, 1983, Ser. No. 462,826
Term of patent 14 years
U.S. Cl. D28—29

280,350
HAIRSETTER
Carl Yurdin, Port Washington, N.Y., assignor to Clairol Incorporated, New York, N.Y.
Filed Mar. 4, 1983, Ser. No. 471,979
Term of patent 14 years
U.S. Cl. D28—38



280,351
MANICURE INSTRUMENT
Weldon Shay, 2324 S. Ewing, Dallas, Tex. 75216
Filed May 13, 1983, Ser. No. 494,354
Term of patent 14 years
U.S. Cl. D28—57

280,352
VANITY MIRROR
Gerald J. Ardito, 29 Meadow Rd., Old Westbury, N.Y. 11568
Filed Nov. 1, 1982, Ser. No. 438,251
Term of patent 14 years
U.S. Cl. D28—64.1



280,353
SINGLE PRESSED POWDER COMPACT
Marcel Buchet, Paris, France, assignor to L'Oreal, S.A., Paris, France
Filed Mar. 24, 1983, Ser. No. 478,276
Term of patent 14 years
U.S. Cl. D28—78

280,354
COSMETIC CASE
Dieter Bakic, Roemerstrasse 15, D-8000 Munich 40, Fed. Rep. of Germany
Filed Sep. 12, 1983, Ser. No. 531,335
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1983, 11 AR 892/83
Term of patent 14 years
U.S. Cl. D28—82

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 27TH DAY OF AUGUST, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. H. Robins Company, Inc.: *See*—
Lunsford, Carl D.; and Chen, Ying-Ho, 4,538,001, Cl. 568-633.000.

A. O. Smith Corp.: *See*—
Shaikh, Maqboolhusein G., 4,538,200, Cl. 361-117.000.

Ab Leo: *See*—
Stamvik, Anders R.; Kristensson, Sten K.; and Lundvall, Karl-Erik, 4,537,722, Cl. 260-397.400.

Abbott, Bernard J.; Debono, Manuel; and Fukuda, David S., to Eli Lilly and Company. Derivatives of A-21978C cyclic peptides. 4,537,717, Cl. 260-112.50R.

Abbott, Richard E.: *See*—
Schachter, David; Abbott, Richard E.; and Cogan, Uri, 4,537,718, Cl. 260-112.50R.

Abe, Shunichi; Akiyama, Mitsuo; and Kudo, Yoshihiko, to Konishiroku Photo Industry Co., Ltd. Circuit for electric power source. 4,538,231, Cl. 364-483.000.

Abe, Toshiro: *See*—
Kimura, Akira; Ishihama, Masao; Abe, Toshiro; Shimada, Kiyoshi; and Matsui, Shinichi, 4,537,275, Cl. 180-300.000.

Abecassis, Jacky: *See*—
Boiron, Jean; Boiron, Christian; Abecassis, Jacky; and Favier, Andre-Marcel, 4,537,512, Cl. 366-132.000.

Abraham, Bernard M.; Miyano, Kenjiro; and Ketterson, John B., to United States of America, Energy. Method and apparatus for measuring shear modulus and viscosity of a monomolecular film. 4,537,064, Cl. 73-54.000.

Aburatani, Kenji: *See*—
Ooshiro, Takehiko; Iwasaki, Masayoshi; Sahara, Kousuke; Suzuki, Norio; Utsumi, Hitoshi; Miyake, Kazuo; and Aburatani, Kenji, 4,537,073, Cl. 73-602.000.

Achar, Bappalige N.; Fohlen, George M.; and Parker, John A., to United States of America, National Aeronautics and Space Administration. Metal (II) 4,4',4'',4'''-phthalocyanine tetraamines as curing agents for epoxy resins. 4,537,834, Cl. 428-413.000.

Achinger, Michael; Jaeger, Erhard; Lipp, Reinhold; and Streitenberger, Walter, to Achinger, Michael. Molding machine for making flaskless molds. 4,537,238, Cl. 164-169.000.

Acla, Howard L.: *See*—
Ritsko, Joseph E.; and Acla, Howard L., 4,537,750, Cl. 423-65.000.

Adam, Gunter, to Puma-Sportschuhfabriken Rudolf Dassler KG. Grip for a racket, especially a tennis racket. 4,537,399, Cl. 273-75.000.

Adam, Gunter, to Puma-Sportschuhfabriken Rudolf Dassler KG. Racket grip having a grip strip. 4,537,400, Cl. 273-75.000.

Adams, Maynard L.: *See*—
Roney, Thomas W.; and Adams, Maynard L., 4,537,446, Cl. 297-464.000.

Adenau, Marvin L.: *See*—
Simon, Virgil S.; Adenau, Marvin L.; and Skalski, John S., 4,537,316, Cl. 211-133.000.

Aderneck, Stephen: *See*—
Aderneck, Stephen E., 4,537,235, Cl. 144-193.00C.

Aderneck, Stephen E., to Aderneck, Stephen. Wood splitter. 4,537,235, Cl. 144-193.00C.

Adleman, Larry G. Follow bar with cam tracks for rocker type conduit bender. 4,537,052, Cl. 72-154.000.

Adolphi, Heinrich: *See*—
Lange, Arno; Merger, Franz; Hettinger, Peter; and Adolphi, Heinrich, 4,537,901, Cl. 514-404.000.
Seufert, Walter; Varwig, Juergen; Seppelt, Wolfgang; and Adolphi, Heinrich, 4,537,884, Cl. 514-127.000.

Adsett, David E., to Allied Corporation. Method and apparatus for distributing leading space. 4,538,186, Cl. 358-298.000.

Adur, Ashok M.; Schmukler, Seymour; Maconis, John, Jr.; and Shida, Mitsuzo, to Chemplex Company. Composite structures. 4,537,836, Cl. 428-522.000.

Advanced Micro Devices, Inc.: *See*—
Sokolovsky, Paul J., 4,537,059, Cl. 73-7.000.
Varadarajan, Hemmige D., 4,538,075, Cl. 307-454.000.

Agan Chemical Manufacturers, Ltd.: *See*—
Pikarski, Michael; Gabe, Julian; and Dykman, Edmund, 4,537,992, Cl. 564-437.000.

Agarwal, Pawan K.; and Lundberg, Robert D., to Exxon Research and Engineering Co. Gelation of hydrocarbon solutions of blends of associating and non-associating polymers. 4,537,919, Cl. 523-336.000.

Agency of Industrial Science and Technology: *See*—
Toraichi, Kazuo; Otsu, Nobuyuki; and Suzuki, Motomu, 4,538,227, Cl. 364-414.000.

Agfa-Gevaert Aktiengesellschaft: *See*—
Boie, Immo; Luhrig, Hermann; and Kovacic, Guido, 4,537,486, Cl. 354-317.000.

AGFA-Gevaert N.V.: *See*—
Muylle, Wilfried E., 4,537,306, Cl. 206-455.000.
Van de Sande, Christian C.; Verhecken, Andre ; and Janssens, Wilhelmus, 4,537,853, Cl. 430-218.000.

Ahrel, Bo A.: *See*—
Henriksson, Sven-Erik D.; Ahrel, Bo A.; Svensson, Claes G. S.; and Franzen, Torsten A. H., 4,537,655, Cl. 162-23.000.

Air Products and Chemicals, Inc.: *See*—
Di Stefano, Frank V., 4,537,831, Cl. 428-514.000.

Airlette Manufacturing Corporation, Inc.: *See*—
Jarnot, Frank R., 4,537,119, Cl. 98-52.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Maruyama, Katsuaki; Oishi, Yaichi; Noda, Norio; Terada, Takami; and Hyodo, Motoi, 4,537,444, Cl. 297-284.000.
Naramoto, Yuichi, 4,537,411, Cl. 280-6.00R.

Aizawa, Yukio: *See*—
Ohmori, Tadashi; Fujiso, Tokuo; Yasui, Eiji; Nomura, Soichi; and Aizawa, Yukio, 4,537,872, Cl. 502-230.000.

Ajiki, Yoshio; and Matsuura, Masaaki, to Honda Giken Kogyo Kabushiki Kaisha. Valve actuating apparatus. 4,537,164, Cl. 123-90.160.

Ajinomoto Company Incorporated: *See*—
Kato, Toshihisa; Iwagami, Hisao; and Yasuda, Naohiko, 4,537,719, Cl. 260-239.00A.

Akaba, Hayao; Yamada, Takeshi; and Jinbo, Masahiro, to Hoya Lens Corporation. Motor-driven subjective phorometer. 4,537,480, Cl. 351-235.000.

Akashi, Tetsuji: *See*—
Kato, Masaaki; and Akashi, Tetsuji, 4,537,352, Cl. 239-90.000.

Akiyama, Mitsuo: *See*—
Abe, Shunichi; Akiyama, Mitsuo; and Kudo, Yoshihiko, 4,538,231, Cl. 364-483.000.

Aklonis, Carol A.: *See*—
O'Sullivan, Joseph; Aklonis, Carol A.; and Singh, Pushpa, 4,537,858, Cl. 435-119.000.

Albert, Hans, to Scapa Inc. Papermakers fabric constructed of extruded slotted elements. 4,537,658, Cl. 162-348.000.

Albrecht, Eckart: *See*—
Maier, Siegfried; and Albrecht, Eckart, 4,537,424, Cl. 285-7.000.

Albrecht, Wolf-Wigand; Hoppe, Axel; Papp, Uwe; and Wolf, Rudiger, to Hermann C. Starck Berlin. Process for producing valve-metal anodes for electrolytic capacitors. 4,537,641, Cl. 148-11.50P.

Alcantara, Miguel A.: *See*—
Lazcano-Navarro, Arturo; and Alcantara, Miguel A., 4,537,629, Cl. 75-130.00R.

Alchas, Paul G., to Becton, Dickinson and Co. Self-venting, non-coring needle assembly. 4,537,593, Cl. 604-411.000.

Alcon Laboratories, Inc.: *See*—
York, Billie M., Jr., 4,537,892, Cl. 514-278.000.

Alexander, Jose; and Fix, Joseph A., to Merck & Co., Inc. Enhancing absorption of drugs from gastrointestinal tract using acylcarnitines. 4,537,772, Cl. 514-9.000.

Alexander, Rayburn G. Water shield for a metal disintegrator device. 4,538,043, Cl. 219-69.00V.

Alexander, Robert L.; Bequette, Robert J.; Kensler, Terry T.; and Scott, Joseph A., to Mead Johnson & Company. Lyophilized cyclophosphamide. 4,537,883, Cl. 514-110.000.

Alger, Terry W.: *See*—
Benett, William J.; and Alger, Terry W., 4,538,277, Cl. 372-33.000.

Allemand, Didier: *See*—
Degoix, Bernard; Boussemaer, Daniel; and Allemand, Didier, 4,537,468, Cl. 350-96.210.

Allen, Crowley C., Jr., to Research Triangle Institute. Fluid distributor. 4,537,217, Cl. 137-561.00A.

Alliages Frittes METAFRAM: *See*—
Eudier, Michel; Huret, Noel; and Meunier, Jean, 4,537,167, Cl. 123-193.00C.

Allied Colloids Limited: *See*—
Flesher, Peter; and Langley, John G., 4,537,513, Cl. 366-162.000.

Allied Corporation: *See*—
Adsett, David E., 4,538,186, Cl. 358-298.000.
Bart, Edward F.; Chu, Arthur S.; and Cook, George R., 4,537,635, Cl. 106-277.000.
Budzyn, Boleslaw L.; and Carlson, Charles E., 4,537,239, Cl. 164-423.000.
Chang, Irving B.; and Beckwith, Robert E., Jr., 4,537,922, Cl. 524-82.000.
De Metz, Frederick C.; and Rackliffe, John R., 4,538,250, Cl. 367-154.000.
Oxenrider, Bryce C.; and Long, David J., 4,537,728, Cl. 260-455.00R.
Thomas, Rudy V., 4,537,363, Cl. 242-107.40A.
Tsang, Peter H.; Coyle, Joseph P.; Liu, Tung; and VanderPoorte, John G., 4,537,823, Cl. 428-308.400.

Van Der Puy, Michael; Kolc, Jaroslav F.; Anello, Louis G.; Hendrickson, Larry L.; Rogic, Milorad M.; and Swerdloff, Michael D., 4,537,614, Cl. 71-28.000.

Alloy Surfaces Company, Inc.: *See—*
Baldi, Alfonso L., 4,537,927, Cl. 524-407.000.

Alma Piston Company: *See—*
Lech, Thaddeus, Jr.; and Popchock, Richard T., 4,537,296, Cl. 192-106.200.

Almeida, Robert. Apparatus for improving oil storage tanks. 4,537,211, Cl. 137-1.000.

Alps Electric Co., Ltd.: *See—*
Hiyama, Torao; and Nishizawa, Kazuo, 4,538,132, Cl. 336-221.000.

Alsenz, Richard H.; and Ansted, Roger C. Method and apparatus for controlling pressure in a single compressor refrigeration system. 4,537,038, Cl. 62-118.000.

Altherr, Russell G.: *See—*
Kaim, John W.; Berg, Norman A.; and Altherr, Russell G., 4,537,304, Cl. 206-335.000.

Alto, Kenneth W.: *See—*
Castellano, Gary M.; and Alto, Kenneth W., 4,537,404, Cl. 273-422.000.

Alzo, Inc.: *See—*
Fogel, Arnold W.; and Zofchak, Albert, 4,537,762, Cl. 424-70.000.

Amemiya, Yoichi: *See—*
Kawada, Shigeki; Amemiya, Yoichi; Sogabe, Masatoyo; and Iwamatsu, Noboru, 4,538,084, Cl. 310-217.000.

American Commercial Barge Line Co.: *See—*
Nivin, James E., 4,537,147, Cl. 114-201.00R.

American Cyanamid Company: *See—*
Cerini, Costantino P., 4,537,769, Cl. 424-89.000.
Grasso, Charles P., 4,537,988, Cl. 562-478.000.
Petersen, Arthur W.; and Smialowicz, Dennis T., 4,537,638, Cl. 134-2.000.
Savides, Christos; and Robertson, Ailan J., 4,537,993, Cl. 568-14.000.

American District Telegraph Company: *See—*
Harvey, Roy L.; Griffin, Kevin J.; Galvin, Aaron A.; and Auerbach, Louis H., 4,538,138, Cl. 340-521.000.

American Home Products Corporation: *See—*
Scotese, Anthony C.; Morris, Robert L.; Santilli, Arthur A.; and Strike, Donald P., 4,537,968, Cl. 546-209.000.

American Home Products Corporation (Del.): *See—*
Phillipps, Patrick G.; and Schenkel, Jeffrey, 4,537,196, Cl. 128-630.000.

American Screen Printing Equipment Co.: *See—*
Bubley, Henry J., 4,537,126, Cl. 101-123.000.

American Sterilizer Company: *See—*
Confer, Richard G., 4,537,276, Cl. 181-21.000.
Fisher, Kenneth J.; and Miller, William R., 4,538,214, Cl. 362-147.000.

Ameron Inc.: *See—*
Carter, J. Warne, Sr., 4,537,426, Cl. 285-110.000.

Amersfoort, Andre G., to Boldt Industries, Inc. Two stage meat strainer. 4,536,920, Cl. 17-46.000.

Amonett, Daniel K., to Emhart Industries, Inc. Clutch for a timing mechanism. 4,538,037, Cl. 200-38.00R.

AMP Incorporated: *See—*
Douty, George H.; Landis, John M.; and Snyder, Clair W., Jr., 4,537,454, Cl. 339-45.00M.
Manabe, Sakae, 4,537,462, Cl. 339-259.00R.
Wise, Joseph A.; and Green, Michael P., 4,538,024, Cl. 174-117.00F.

Ampex Corporation: *See—*
Louth, Kenneth, 4,538,190, Cl. 360-73.000.

AMSTED Industries Incorporated: *See—*
Kaim, John W.; Berg, Norman A.; and Altherr, Russell G., 4,537,304, Cl. 206-335.000.

Amtel Systems Corporation: *See—*
Drabing, Richard B., 4,538,136, Cl. 340-310.00R.

Anatros Corporation: *See—*
Danby, Hal C.; and Ciupke, Werner W., 4,537,387, Cl. 251-331.000.

Anderson, George F., to U.S. Leisure Incorporated. Nozzle for water tub. 4,537,358, Cl. 239-413.000.

Anderson, Marie T.; Michel, Karl H.; and Sands, Thomas H., to Eli Lilly and Company. A52688 Antibiotics and process for their production. 4,537,777, Cl. 514-521.000.

Anderson, Marie T.: *See—*
Boeck, LaVerne D.; Clem, Gladys M.; Hershberger, Charles L.; Anderson, Marie T.; and Michel, Karl H., 4,537,715, Cl. 260-112.50R.

Anderson, Richard N., to Hunter Douglas Inc. Insulated glass spacer support. 4,537,004, Cl. 52-788.000.

Anderson, Robert L., to Ford Motor Company. Output transistor driver diagnostic system. 4,538,106, Cl. 324-158.00T.

Anderson, Wayne R., to Sundstrand Corporation. Two member boost stage valve for a hydraulic control. 4,537,220, Cl. 137-625.640.

Andersson, Roger: *See—*
Johansson, Soren; Andersson, Roger; and Jonsson, Lennart, 4,537,581, Cl. 474-123.000.

Andersson, Sven A., to Nils Weibull AB. Arrangement in a silo or the like for storing pulverulent, granular or lumpy material, such as coal. 4,537,553, Cl. 414-302.000.

Ando, Hiroshi: *See—*
Noda, Masahiro; and Ando, Hiroshi, 4,537,287, Cl. 187-29.00R.

Ando, Toshihiko; Ito, Norifumi; Matsubara, Tetsuyuki; Ichikawa, Kozo; Fukawa, Susumu; and Maeda, Tetsuo, to Mitsui Toatsu Chemicals, Inc.; and Toyo Engineering Corporation. Process for the preparation of polymer compositions having low volatile content. 4,537,954, Cl. 528-481.000.

Andren, Carl F.: *See—*
Mosley, William H., Jr.; and Andren, Carl F., 4,538,280, Cl. 375-1.000.

Anello, Louis G.: *See—*
Van Der Puy, Michael; Kolc, Jaroslav F.; Anello, Louis G.; Hendrickson, Larry L.; Rogic, Milorad M.; and Swerdloff, Michael D., 4,537,614, Cl. 71-28.000.

Ang, T. Liem; Van Arnam, Donald; and McFeaters, Earl, to Avery International Corporation. Van label having non-linear discontinuous score lines in the backing. 4,537,809, Cl. 428-41.000.

Angele, Werner, to Pfaff Industriemaschinen GmbH. Method and apparatus for manufacturing pantyhose. 4,536,891, Cl. 2-409.000.

Ansted, Roger C.: *See—*
Alsenz, Richard H.; and Ansted, Roger C., 4,537,038, Cl. 62-118.000.

Antol, Ronald F.: *See—*
Wilhelm, John J.; Kapoor, Anoop; Kobuck, Richard M.; Antol, Ronald F.; and Norris, George W., 4,537,711, Cl. 252-633.000.

Aoba, Takashi: *See—*
Mori, Leo; Tominaga, Mamoru; and Aoba, Takashi, 4,538,216, Cl. 362-311.000.

Apontoweil, Peter; and Kok, Johannes A. G., to Roussel Uclaf. Combined vaccine. 4,537,768, Cl. 424-89.000.

Appareillages et Materiels de Servitudes: *See—*
Tourneur, Auburt, deceased, 4,538,097, Cl. 318-490.000.

Applied Power Inc.: *See—*
Hense, Thomas R.; and Rudolph, Ronald M., 4,536,962, Cl. 33-516.000.

Apri, Edward W. Self-actuating drinking fountain/faucet. 4,537,350, Cl. 239-25.000.

APX Group, Inc.: *See—*
Harwood, Jon W.; Clegg, Michael W.; and Treadwell, Mark C., 4,537,027, Cl. 60-323.000.

Arai, Akio, to Fuji Electric Company, Ltd. Photosensitive element having roughened selenium-arsenic alloy surface. 4,537,849, Cl. 430-85.000.

Arai, Eisuke: *See—*
Yoshino, Hideo; Arai, Eisuke; and Kiuchi, Kazuhide, 4,538,167, Cl. 357-59.000.

Arai, Shigeharu, to Toyota Jidosha Kabushiki Kaisha. Engine mount. 4,537,381, Cl. 248-559.000.

Arakawa, Tatsumi: *See—*
Kambara, Shu; Arakawa, Tatsumi; and Takahashi, Akio, 4,537,950, Cl. 528-380.000.

Argiropoulos, George D; and Sahachaisere, Somchai, to Sta-Rite Industries, Inc. Cartridge filter end cap. 4,537,681, Cl. 210-317.000.

Arima, Kiyoteru: *See—*
Miyako, Haruyoshi; and Arima, Kiyoteru, 4,538,258, Cl. 369-271.000.

Armando, John E.: *See—*
Brown, Vincent B.; Kozel, Charles A.; Scheitz, John T.; and Armando, John E., 4,537,456, Cl. 339-99.00R.

Armour Pharmaceutical Co.: *See—*
Orlowski, Ronald C.; and Seyler, Jay K., 4,537,716, Cl. 260-112.50T.

Armstrong, Gordon P.; Flautt, Martin C.; and Williams, Gary L., to Owens-Corning Fiberglas Corporation. Apparatus for severing strand. 4,537,107, Cl. 83-694.000.

Armstrong, Gordon P.; and Flautt, Martin C., to Owens-Corning Fiberglas Corporation. Method and apparatus for producing chopped strands. 4,537,610, Cl. 65-3.440.

Arndt, Friedrich: *See—*
Boroschewski, Gerhard; and Arndt, Friedrich, 4,537,622, Cl. 71-108.000.

Arnold, Edward P.: *See—*
Crain, Stephen F.; Gray, Steven H.; Arnold, Edward P.; and Dodd, Timothy J., 4,538,221, Cl. 364-172.000.

Arzberger, William A.: *See—*
Brown, Merle S.; and Arzberger, William A., 4,537,332, Cl. 222-190.000.

Asahi-Dow Limited: *See—*
Yoshimura, Isao; Hata, Hideo; and Kaneko, Takashi, 4,537,935, Cl. 525-222.000.

Asahi Glass Company Ltd.: *See—*
Asawa, Tatsuro; Sajima, Yasuo; and Iwamoto, Junjiro, 4,537,673, Cl. 204-253.000.

Asahi Kasei Kogyo Kabushiki Hiraoka & Co.: *See—*
Tanaka, Masaho; Shishido, Tomio; Fukuhara, Tetsukazu; Yao, Yugo; Kobayashi, Kunihilo; and Inoue, Yoshio, 4,538,042, Cl. 219-58.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Chono, Masazumi; and Ishida, Hiroshi, 4,537,757, Cl. 423-328.000.
Tanaka, Masaho; Shishido, Tomio; Fukuhara, Tetsukazu; Yao, Yugo; Kobayashi, Kunihilo; and Inoue, Yoshio, 4,538,042, Cl. 219-58.000.

Asakawa, Shiroh: *See—*
Itoh, Yoshimasa; and Asakawa, Shiroh, 4,537,606, Cl. 55-158.000.

Asano, Masao; Fujimatsu, Wataru; Matsumoto, Kazumasa; Murata, Hideki; Sato, Toshihiko; and Watanabe, Kenji, to Konishiroku Photo Industry Co., Ltd. Magnetic recording medium. 4,537,824, Cl. 428-323.000.

Asanuma, Tetsu; and Inagaki, Satoru, to Fuji Xerox Co., Ltd. Fixing roller for a copying machine. 4,538,052, Cl. 219-469.000.

Asari, Akira; Tsuzuki, Hidehiro; Inoue, Yoichi; and Tabuchi, Takahisa, to Kabushiki Kaisha Kobe Seiko Sho. Hot isostatic pressing apparatus. 4,537,569, Cl. 425-405.00H.

Asawa, Tatsuro; Sajima, Yasuo; and Iwamoto, Junjiro, to Asahi Glass Company Ltd. Electrolytic cell. 4,537,673, Cl. 204-253.000.

ASC Incorporated: *See*—
Brockway, Patrick H.; Lehr, Howard C.; and George, Richard D., 4,537,440, Cl. 296-108.000.

Ascoe Felts, Inc.: *See*—
Booth, Ian K.; and Cunnane, Francis J., III, 4,537,816, Cl. 428-234.000.

ASEA Aktiebolag: *See*—
Dubon, Chantal; Hok, Bertil; and Ovren, Christer, 4,537,467, Cl. 350-96.200.

Ashida, Akira, to Hitachi, Ltd. Clock extraction circuit using an oscillator and phase-locked programmable divider. 4,538,119, Cl. 331-1.00A.

Ashley, Walter M., Jr.: *See*—
Inglett, Wilfred L., Jr.; Ashley, Walter M., Jr.; and Manfredonia, Abe J., 4,537,015, Cl. 53-386.000.

Ashton, Robert G.: *See*—
Wrobel, Stanley A.; and Ashton, Robert G., 4,537,068, Cl. 73-202.000.

Asoma, Yoshito, to Olympus Optical Co., Ltd. Objective lens system for microscopes. 4,537,472, Cl. 350-414.000.

Astero, Ulf J., to Optik Innovation AB OIAB. Optical system for projection. 4,537,474, Cl. 350-432.000.

Astro-Stream Corporation, The: *See*—
Cymbler, Murray J., 4,537,405, Cl. 273-428.000.

Asulab S.A.: *See*—
Dinger, Rudolf; Michel, Jean-Georges; and Leuenberger, Claude-Eric, 4,537,515, Cl. 368-202.000.

AT&T Bell Laboratories: *See*—
Henry, Charles H.; and Logan, Ralph A., 4,536,940, Cl. 29-569.00L.
Peterson, Thomas A., 4,538,224, Cl. 364-200.000.

AT&T Bell Laboratories, Inc.: *See*—
Williamson, Andrew H., Jr., 4,538,021, Cl. 174-92.000.

AT&T Information Systems Inc.: *See*—
Fossett, Lawrence D.; and Michael, Steven C., 4,538,030, Cl. 179-7.1TP.
Kohs, Dwight W., 4,538,271, Cl. 371-49.000.

AT&T Technologies, Inc.: *See*—
Banks, Edward L.; Ellington, Thomas S., IV; and Zavecz, Terrence E., 4,537,498, Cl. 355-55.000.
Dorey, John K., II; Schmidt, Steven L.; and Townsend, Wesley P., 4,537,799, Cl. 427-259.000.
Hardesty, Edwin C.; and Hardesty, Ronald C., 4,536,939, Cl. 29-566.400.
Kuyel, Birol, 4,537,813, Cl. 428-209.000.
Macdonald, David I., 4,537,663, Cl. 204-14.100.
Ouellette, Paul J., 4,537,461, Cl. 339-258.00R.

AT&T Teletype Corporation: *See*—
Durkee, David B.; and Liebman, Alan J., 4,538,156, Cl. 346-21.000.

Athey, Roy L., to United Technologies Corporation. Method for eliminating low cycle fatigue cracking in integrally bladed disks. 4,536,932, Cl. 29-156.80B.

Atlantic Richfield Company: *See*—
Shum, Wilfred P.; White, John F.; and Beals, Eva M., 4,537,998, Cl. 568-483.000.

Atlas Steel Rule Die, Inc.: *See*—
Graboyes, Herman A., 4,537,124, Cl. 101-28.000.

Atomic Energy of Canada Limited: *See*—
Liu, Dirkson D. S., 4,537,503, Cl. 356-28.500.

Atteberry, Eldon A.: *See*—
LaRou, Albert M.; and Atteberry, Eldon A., 4,537,519, Cl. 384-478.000.

Atwell, Graham J.: *See*—
Rewcastle, Gordon W.; Atwell, Graham J.; Baguley, Bruce C.; and Denny, William A., 4,537,729, Cl. 260-944.000.

Audiovox Corp.: *See*—
Turner, Earl W., 4,538,135, Cl. 340-63.000.

Auerbach, Louis H.: *See*—
Harvey, Roy L.; Griffin, Kevin J.; Galvin, Aaron A.; and Auerbach, Louis H., 4,538,138, Cl. 340-521.000.

Ausschnitt, Christopher P., to Perkin-Elmer Corporation, The. Overlay test wafer. 4,538,105, Cl. 324-158.00R.

Automotive Products plc: *See*—
Davies, David A., 4,537,297, Cl. 192-106.200.
Hanson, William M., 4,537,524, Cl. 403-140.000.
Osborne, Duncan W., 4,537,293, Cl. 188-196.0BA.

Avery International Corporation: *See*—
Ang, T. Liem; Van Arnam, Donald; and McFeaters, Earl, 4,537,809, Cl. 428-41.000.

Aviram, Ari, to International Business Machines Corporation. Light induced capacitance changes in donor polymers (or small molecules) films and its use for information storage in video disks and the like. 4,538,252, Cl. 369-13.000.

Avra, Raymond E.: *See*—
Herrington, Lawrence; and Avra, Raymond E., 4,537,367, Cl. 242-198.000.

Axelrod, Lester: *See*—
Oster, Stanley M.; and Axelrod, Lester, 4,537,099, Cl. 225-93.000.

Ayata, Naoki: *See*—
Saito, Seiji; Ayata, Naoki; Suzuki, Hidetoshi; Ozawa, Kunitaka; and Koumura, Noboru, 4,538,182, Cl. 358-280.000.

Babbitt, Richard W.: *See*—
Mariani, Elio A.; Stern, Richard A.; and Babbitt, Richard W., 4,538,123, Cl. 333-208.000.

Baer, Harold J.: *See*—
Smith, Roger D.; and Baer, Harold J., 4,537,401, Cl. 273-112.000.

Baer, Karl: *See*—
Goetz, Norbert; Laas, Harald; Tavs, Peter; Hupfer, Leopold; and Baer, Karl, 4,538,009, Cl. 568-799.000.

Baguley, Bruce C.: *See*—
Rewcastle, Gordon W.; Atwell, Graham J.; Baguley, Bruce C.; and Denny, William A., 4,537,729, Cl. 260-944.000.

Bahr, Richard G.; and Moore, Russell L., to Prime Computer, Inc. Self-repairing ring communications network. 4,538,264, Cl. 371-8.000.

Baier, Manfred; and Rascher, Andreas, to BBC Brown, Boveri & Company, Ltd. Air-core choke coil. 4,538,131, Cl. 336-57.000.

Baker, Charles M. Automatic coal stove stoker. 4,537,140, Cl. 110-281.000.

Baker, Henry L.: *See*—
Gargini, Eric J.; and Baker, Henry L., 4,538,174, Cl. 358-86.000.

Baker, John N.: *See*—
Rogers, Colin C.; Baker, John N.; and Estebanez, Joseph, 4,537,212, Cl. 137-2.000.

Baker Perkins Exports Pty. Ltd.: *See*—
Willett, Paul E., 4,538,050, Cl. 219-388.000.

Balbes, Michael S.; Day, Charles E.; Hooper, Robert L.; and Lin, Hank S., to Microdyne Corporation. Receive only earth satellite ground station. 4,538,175, Cl. 358-86.000.

Baldi, Alfonso L., to Alloy Surfaces Company, Inc. Diffusion coating mixtures. 4,537,927, Cl. 524-407.000.

Baldwin, Bernard A.: *See*—
Macdonell, Gary D.; Lindstrom, Merlin R.; Baldwin, Bernard A.; Louthan, Rector P.; and Schuettenberg, Alexander D., 4,537,690, Cl. 252-48.400.

Ballarati, Vito; and Tajana, Franco, to Val Lesina S.p.A. Fabrics with a crepe effect constituted by continuous texturized synthetic yarns of high yarn/count/no. of filaments ratio. 4,537,227, Cl. 139-420.00R.

Ballatore, Daniel; Bonnet, Yves A.; Ferry, Michel F.; and Jacquart, Christian A., to International Business Machines Corporation. Interface circuit with impedance adaptation means. 4,538,032, Cl. 179-170.00D.

Baltes, Heinrich P.; Glass, Andrew S.; and Jauch, Karl, to LGZ Landis & Gyr Zug AG. Security blank with enhanced authenticating features, and a method and an apparatus for determining the genuineness of the security blank. 4,537,504, Cl. 356-71.000.

Baltz, Richard H.; Wild, Gene M.; and Seno, Eugene T., to Eli Lilly and Company. Process for the production of mycaminosyltylonolide. 4,537,957, Cl. 336-7.100.

Baltzer, Karen L.; and Peterson, Jan B., to Kavouras, Inc. System for preparing aircraft driftdown plans. 4,538,229, Cl. 364-428.000.

Balzer, Norbert R., to Park-Ohio Industries, Inc. Method of shearing metal billets. 4,537,102, Cl. 83-16.000.

Bando, Yoshihide, to Omron Tateisi Electronics Co. Electromagnetic relay with symmetric reaction. 4,538,126, Cl. 335-78.000.

Banks, Edward L.; Ellington, Thomas S., IV; and Zavecz, Terrence E., to AT&T Technologies, Inc. Focal plane adjusted photomask and methods of projecting images onto photosensitized workpiece surfaces. 4,537,498, Cl. 355-55.000.

Banks, Edwin R.; Ray, Roger C.; and Dale, Paul B. Table-driven apparatus for data display and modification. 4,538,225, Cl. 364-200.000.

Barber, James C., to James C. Barber and Associates, Inc. Fertilizer from phosphorus furnace waste stream. 4,537,615, Cl. 71-36.000.

Barber, Michael F. Fluid discriminating apparatus. 4,537,232, Cl. 141-382.000.

Bardoux, Raymond; and Joffre, Henri, to Commissariat a l'Energie Atomique; and Merlin Gerin. Practical device for the measurement of the absorbed dose versus depth in soft tissues. 4,538,071, Cl. 250-505.100.

Barker, Ronald C.; and Schuler, Chester L., to Montage Computer Corporation. Video composition method and apparatus. 4,538,188, Cl. 360-14.300.

Barnaby, Harold T., to Core Laboratories, Inc. Nonsteady-state core holder. 4,537,063, Cl. 73-38.000.

Barnett, Steve M.; Flowers, Michael A.; and Varos, John A., to Pioneer Industrial Products Company. Glove for low particulate environment. 4,536,890, Cl. 2-164.000.

Barnicol-Ottler, Max; Loczenski, Martin; Mieschke, Norbert; Ott, Gerhard; Przybylski, Gerhard; and Weber, Dietmar, to Siemens Aktiengesellschaft. Flexible electric cable. 4,538,022, Cl. 174-113.00R.

Barnoin, Pierre; Mens, Jacques M. N.; and Merle, Gilbert, to Societe Nationale Industrielle Aerospatiale. Structural supports and aircraft landing gears including such supports. 4,537,374, Cl. 244-102.00R.

Barraclough, Paul: *See*—
Harris, Clifford J.; and Barraclough, Paul, 4,537,972, Cl. 548-302.000.

Barrom, Donna L.: *See*—
Russ, Julio G.; and Barrom, Donna L., 4,537,766, Cl. 424-63.000.

Bart, Edward F.; Chu, Arthur S.; and Cook, George R., to Allied Corporation. Tar fraction for driveway sealers using oxidized coal tar distillate. 4,537,635, Cl. 106-277.000.

Barth, Phillip W., to Leland Stanford Junior University, The Board of Trustees of the. Integral fluid filter and capillary. 4,537,680, Cl. 210-316.000.

Bartmann, Martin; Bax, Hanns-Jorg; Burzin, Klaus; and Ribbing, Wilfried, to Chemische Werke Huls AG. Process for the production of polyphenylene oxides. 4,537,948, Cl. 528-215.000.
Barton, Ross J.: *See*—
Petersen, Oscar J.; Barton, Ross J.; Dalke, Jack E.; Sheffield, Gerald W.; and Towle, Theodore, 4,537,384, Cl. 251-83.000.
Barton, Russell L.; Briggs, Stephen L.; and Koppel, Gary A., to Eli Lilly and Company. Process for recovering 2-acetylthiomethyl-5-aminopentanoic acid. 4,537,727, Cl. 260-455.00R.
Basf Aktiengesellschaft: *See*—
Bergmann, Udo; Degen, Helmut; Hansen, Guenter; Krallmann, Reinhold; and Weber, Hans, 4,537,597, Cl. 8-639.000.
Burger, Arnulf; Scharff, Karl-Heinz; Geiger, Kurt; Schnee, Gunther; and Pieper, Hartwig, 4,536,909, Cl. 15-4.000.
Goetz, Norbert; Laas, Harald; Tavs, Peter; Hupfer, Leopold; and Baer, Karl, 4,538,009, Cl. 568-799.000.
Grychtol, Klaus; and Baumann, Hans, 4,537,955, Cl. 534-696.000.
Lange, Arno; Merger, Franz; Hettinger, Peter; and Adolphi, Heinrich, 4,537,901, Cl. 514-404.000.
Merger, Franz; Nestler, Gerhard; and Towae, Friedrich, 4,537,960, Cl. 544-86.000.
Oppenlaender, Knut; Fikentscher, Rolf; Buettner, Egon; Slotman, Wilhelmus; Schwartz, Erich; and Mohr, Rudolf, 4,537,701, Cl. 252-344.000.
Parg, Adolf; Ziegler, Hans; and Wuerzer, Bruno, 4,537,621, Cl. 71-103.000.
Plath, Peter; Eicken, Karl; Sauter, Hubert; and Wuerzer, Bruno, 4,537,617, Cl. 71-92.000.
Reissenweber, Gernot; Kersten, Siegfried; Ditter, Walter; and Jacobs, Peter, 4,537,986, Cl. 560-132.000.
Schmidt, Franz; Pipper, Gunter; Floss, Josef G.; and Zahradnik, Franz, 4,537,949, Cl. 528-335.000.
Schneider, Heinz-Walter; Richter, Wolfgang; Disteldorf, Walter; and Kummer, Rudolf, 4,537,987, Cl. 560-193.000.
Seufert, Walter; Varwig, Juergen; Seppelt, Wolfgang; and Adolphi, Heinrich, 4,537,884, Cl. 514-127.000.
Wagner, Eckhart; Volkamer, Klaus; and Wagner, Ulrich, 4,537,753, Cl. 423-228.000.
Battelle Memorial Institute: *See*—
Rohrmann, Charles A.; and Fullam, Harold T., 4,537,835, Cl. 423-502.000.
Baumann, Hans: *See*—
Grychtol, Klaus; and Baumann, Hans, 4,537,955, Cl. 534-696.000.
Baumann, Heinz, to Schaum-Chemie W. Bauer GmbH & Co. KG. Method of preparing a urea-formaldehyde combination foam that is low in formaldehyde. 4,537,913, Cl. 521-107.000.
Baumgarth, Rolf: *See*—
Brearey, Nicholas J.; and Baumgarth, Rolf, 4,538,228, Cl. 364-426.000.
Bausch & Lomb Incorporated: *See*—
Ogunbiyi, Lai; Scott, Francis L.; and Smith, Francis X., 4,537,746, Cl. 422-28.000.
Bavelloni, Franco, to Z. Bavelloni S.p.A. Pressure shoe for glass processing apparatus. 4,537,301, Cl. 198-626.000.
Bax, Hanns-Jorg: *See*—
Bartmann, Martin; Bax, Hanns-Jorg; Burzin, Klaus; and Ribbing, Wilfried, 4,537,948, Cl. 528-215.000.
Baxter, Alan R., to Jacmorr Manufacturing Limited. Three part slide. 4,537,450, Cl. 308-3.800.
Bayer Aktiengesellschaft: *See*—
Brandes, Wilhelm; and Daum, Werner, 4,537,905, Cl. 514-521.000.
Feyen, Peter; Seifert, Hermann; and Kohler, Egon, 4,537,730, Cl. 260-989.000.
Gabel, Eike; Blank, Heinz U.; and Behre, Horst, 4,538,007, Cl. 568-751.000.
Groll, Manfred; and Ockelmann, Dieter, 4,537,721, Cl. 260-242.200.
Heiker, Fred R.; Stoltefuss, Jurgen; Franckowiak, Gerhard; Schramm, Matthias; Thomas, Gunter; and Gross, Rainer, 4,537,881, Cl. 514-25.000.
Hoff, Dieter; and Ramsch, Klaus-Dieter, 4,537,898, Cl. 514-356.000.
Idel, Karsten; Ostlinning, Edgar; Koch, Wolfgang; Bottenbruch, Ludwig; and Heitz, Walter, 4,537,951, Cl. 528-388.000.
Muller, Hanns P.; and Schafer, Karl, 4,537,596, Cl. 8-115.600.
Naumann, Klaus; Scheinpflug, Hans; Rosslenbroich, Hans-Jurgen; and Paul, Volker, 4,537,888, Cl. 514-228.000.
Starzewski, Karl-Heinz A. O.; and Witte, Josef, 4,537,982, Cl. 556-22.000.
BBC Aktiengesellschaft Brown, Boveri & Cie: *See*—
Gross, Franz; Wahl, Georg; and Nicoll, Andrew R., 4,537,744, Cl. 420-446.000.
BBC Brown, Boveri & Company, Ltd.: *See*—
Baier, Manfred; and Rascher, Andreas, 4,538,131, Cl. 336-57.000.
Volks, Gunter, 4,537,157, Cl. 122-412.000.
BBC Industries Inc.: *See*—
Brown, Claude D., 4,537,345, Cl. 236-11.000.
Beals, Eva M.: *See*—
Shum, Wilfred P.; White, John F.; and Beals, Eva M., 4,537,998, Cl. 568-483.000.
Beard, Franklin. Sonic fracing process and means to carry out said process. 4,537,256, Cl. 166-299.000.
Bearden, Roby; and Stuntz, Gordon F., to Exxon Research and Engineering Co. Reducing metal content of oil feeds. 4,537,676, Cl. 208-251.00R.
Becher, Friedrich; and Eggert, Walter, to Hermann Pfauter GmbH & Co. Method of shaping by generating for producing profiles on workpieces, and apparatus for performing this method. 4,537,537, Cl. 409-34.000.
Beck, Franklin L., to Sperry Corporation. Sway rod suspension system. 4,537,382, Cl. 248-568.000.
Beck, Harold K., to Halliburton Company. Low pressure responsive downhole tool. 4,537,258, Cl. 166-374.000.
Beckmann, Friedrich K.; Hoppe, Wolfgang; and Meyer, Wolfgang, to U.S. Philips Corporation. Device for microwave transmission between two bodies which are rotatable relative to each other. 4,538,125, Cl. 333-248.000.
Beckwith, Robert E., Jr.: *See*—
Chang, Irving B.; and Beckwith, Robert E., Jr., 4,537,922, Cl. 524-82.000.
Becton, Dickinson and Co.: *See*—
Alchas, Paul G., 4,537,593, Cl. 604-411.000.
Hasskamp, Paul R., 4,537,231, Cl. 141-238.000.
Beecham Group Limited: *See*—
Rooke, David J.; and Burnstead, Barry W., 4,537,887, Cl. 514-197.000.
Beecham Group p.l.c.: *See*—
Taylor, Andrew W.; and Cook, Richard T., 4,537,886, Cl. 514-193.000.
Behr-Thomson Degnstoffregler GmbH: *See*—
Saur, Roland, 4,537,158, Cl. 123-41.100.
Behre, Horst: *See*—
Gabel, Eike; Blank, Heinz U.; and Behre, Horst, 4,538,007, Cl. 568-751.000.
Beimesch, Bruce J., to National Distillers and Chemical Corporation. Hydraulic fluids based on two centistoke synthetic hydrocarbons. 4,537,696, Cl. 252-75.000.
Beitzer, George W., to Spectron Glass and Electronics, Incorporated. Tilt sensor and method of assembly. 4,536,967, Cl. 33-366.000.
Belanger, Patrice C.; and Gillard, John W., to Merck Frosst Canada, Inc. Substituted phenylalkenoic acids and esters. 4,537,906, Cl. 514-532.000.
Belka, Heinrich, to Esge-Marby GmbH & Co. KG. Baggage carrier for two-wheeled vehicles. 4,537,338, Cl. 224-39.000.
Belko, Robert P.: *See*—
Sprecker, Mark A.; Wiegers, Wilhelmus J.; Belko, Robert P.; and Boden, Richard M., 4,537,704, Cl. 252-522.00R.
Beltronics Inc.: *See*—
Bishop, Robert; and Bezjian, Krikor, 4,537,505, Cl. 356-237.000.
Bencini, Elena: *See*—
Foa , Marco; Francalanci, Franco; Gardano, Andrea; and Bencini, Elena, 4,537,970, Cl. 546-319.000.
Benesh, Joseph C.: *See*—
Lewis, George A.; Collins, Kent L.; Benesh, Joseph C.; and Ward, Patrick C., 4,538,091, Cl. 313-625.000.
Benett, William J.; and Alger, Terry W., to United States of America, Energy. Inductive gas line for pulsed lasers. 4,538,277, Cl. 372-33.000.
Benke, Bela : *See*—
Kreidl, Janos; Farkas nee Kirjak, Maria; Harsanyi, Kalman; Benke, Bela ; Rado, Andras; Domany, Gyorgy; Hegedus, Bela; Csongor, Eva; Deutsch nee Juhasz, Ida; and Petho, Hajnalka, 4,537,900, Cl. 514-400.000.
Benning, Gordon D.; Pascas, Brian J.; Blackhall, Robert K.; Wilker, Paul S.; and Neathway, Graham A., to Trillium Telephone Systems Inc. Home communications and control system. 4,538,031, Cl. 179-81.00B.
Benz, Gotlieb, to Machinenfabrik Flums AG. Method and apparatus for packing soft packages into boxes. 4,537,008, Cl. 53-438.000.
Bequette, Robert J.: *See*—
Alexander, Robert L.; Bequette, Robert J.; Kensler, Terry T.; and Scott, Joseph A., 4,537,883, Cl. 514-110.000.
Berchem, Antoine: *See*—
Kambanis, Stamatis M.; Berchem, Antoine; Gregoire, Dennis; and Rybicky, Jaroslav, 4,537,941, Cl. 527-403.000.
Berenz, John J.; and Nakano, Kenichi, to TRW Inc. Two-gate noncoplanar FET with self-aligned source. 4,537,654, Cl. 156-644.000.
Berg, Norman A.: *See*—
Kaim, John W.; Berg, Norman A.; and Altherr, Russell G., 4,537,304, Cl. 206-335.000.
Bergler, Otto, to Black & Decker Overseas AG. Circular cross-cut and miter saw box. 4,537,105, Cl. 83-471.300.
Bergmann, Udo; Degen, Helmut; Hansen, Guenter; Krallmann, Reinhold; and Weber, Hans, to Basf Aktiengesellschaft. Navy blue mixtures of disperse mono-azo dyes for cellulose acetate. 4,537,597, Cl. 8-639.000.
Bergquist, Bertil R.: *See*—
Tuten, William J.; Crosby, Kennith D.; and Bergquist, Bertil R., 4,538,100, Cl. 318-808.000.
Bergstrom, John R.: *See*—
Lindahl, Jonas A. I.; and Bergstrom, John R., 4,537,656, Cl. 162-38.000.
Berman, Daniel. Ocean thermal energy system. 4,537,030, Cl. 60-641.700.
Bernard, Donald C., to Frito-Lay, Inc. Method of preparing low oil fried potato chips. 4,537,786, Cl. 426-438.000.
Bernel Chemical Co.: *See*—
Fogel, Arnold W.; and Zofchak, Albert, 4,537,762, Cl. 424-70.000.
Bernhard, Horst; and Esselborn, Reiner, to Merck Patent Gesellschaft mit beschrankter Haftung. Process for the preparation of nacreous pigments with improved gloss properties, products thereof, and compositions using said pigments. 4,537,636, Cl. 106-291.000.

Bero, Vernon L.; and Schultz, Fredrick W., to Gold Band Ice Cream, Inc. Apparatus for the manufacture of ice cream sandwiches. 4,537,121, Cl. 99-450.400.

Bertellotti, Ansano; and Traina, Anthony, to GTE Communication Systems Corporation. Printed wiring board file with variable printed wiring board spacings. 4,538,211, Cl. 361-415.000.

Best, Norman D.: *See*—
Wyle, Charles; Shea, Donald M.; and Best, Norman D., 4,536,935, Cl. 29-281.100.

Best, Walter: *See*—
Pulsmeier, Harald; and Best, Walter, 4,536,971, Cl. 34-89.000.

Bezjian, Krikor: *See*—
Bishop, Robert; and Bezjian, Krikor, 4,537,505, Cl. 356-237.000.

Bhatia, Madhukar: *See*—
Resnick, Brian J.; Messina, Elena R.; Bhatia. Madhukar; and Holmes, John G., 4,538,233, Cl. 364-513.000.

Bielinski, Ralph F.; Chacon, M. Frank; Kramer, Dennis M.; Mathias, William R.; and Schneider, Stanley, to Eaton Corporation. Electrothermal wire responsive miniature precision current sensor. 4,538,199, Cl. 361-93.000.

bielomatik Leuze GmbH & Co.: *See*—
Kunzmann, Otto, 4,537,545, Cl. 412-7.000.

Billet, Reinhard; Kober, Rainer; Mackowiak, Jerzy; and Geipel, Werner, to Paul Rauschert GmbH & Co. KG. Saddle filling member for gas-liquid contact. 4,537,731, Cl. 261-94.000.

Billiet, Colin T., to Domnick Hunter Filters Ltd. Apparatus for treating compressed air for breathing purposes. 4,537,748, Cl. 422-122.000.

Binks Manufacturing Company: *See*—
Culbertson, Samuel W.; and Dixon, George, 4,537,357, Cl. 239-290.000.

BIOGAL Gyogyszergyar: *See*—
Horvath, Istvan; Lang, Tibor; Pongo, Laszlo ; Reiter, Jozsef; Somorai, Tamas; Szilagyi, Geza; and Toldy, Lajos, 4,537,899, Cl. 514-384.000.

Biomasa, S.A.: *See*—
Zuloaga, Jose M. A., 4,537,362, Cl. 241-101.700.

Birdy, Jal N.: *See*—
Chen, Jade; Birdy, Jal N.; and Watt, Brian J., 4,537,532, Cl. 405-217.000.

Bishop, Robert; and Bezjian, Krikor, to Beltronics Inc. Method for detecting pin holes and the like in sheet material for packaging and similar applications. 4,537,505, Cl. 356-237.000.

Bishop, Timothy E.; Pasternack, George; and Zimmerman, John M., to DeSoto, Inc. Radiation-curable copolymers of monoethylenic monomers. 4,537,667, Cl. 204-159.150.

Biskupski, Jurgen K.: *See*—
Lakshmanan, Vaikuntam I.; and Biskupski, Jurgen K., 4,537,628, Cl. 75-118.00R.

Bittner, Timothy, to Ioptex Inc. Vaulted intraocular lens. 4,536,895, Cl. 623-6.000.

Bittner, Timothy, to Ioptex Inc. Intraocular lens with appendage manipulation loop. 4,536,896, Cl. 623-6.000.

Bjerregaard, Richard S., to Eli Lilly and Company. Airborne particle dispenser. 4,537,333, Cl. 222-345.000.

Bjor, Hakon E., to Ingenior Thor Furuholmen A/S. Method and means for adjusting the feed support of a rock drilling unit into a given distance from the drilling location. 4,537,263, Cl. 173-1.000.

Black & Decker, Inc.: *See*—
Ryckman, William D., Jr., 4,538,049, Cl. 219-386.000.

Black & Decker Overseas AG: *See*—
Bergler, Otto, 4,537,105, Cl. 83-471.300.

Black, John W.; Shupe, Richard D.; and Simon, Earl, to Pemco-Kalamazoo, Inc. Lifting apparatus for an injection mold. 4,537,570, Cl. 425-450.100.

Blackhall, Robert K.: *See*—
Benning, Gordon D.; Pascas, Brian J.; Blackhall, Robert K.; Wilker, Paul S.; and Neathway, Graham A., 4,538,031, Cl. 179-81.00B.

Blain, Edward S.: *See*—
Siegrist, Gary D.; and Blain, Edward S., 4,536,990, Cl. 49-501.000.

Blanchard, Jean; and Panak, Edouard, to Sanofi, S.A. Methods of using compositions having antithrombotic and anti-blood-platelet-aggregating activity. 4,537,894, Cl. 514-301.000.

Blank, Heinz U.: *See*—
Gabel, Eike; Blank, Heinz U.; and Behre, Horst, 4,538,007, Cl. 568-751.000.

Blass, Jaroslav; and Deal, Michael A., to Copeland Corporation. Valve assembly for a compressor. 4,537,566, Cl. 417-569.000.

Bleicher, Manfred: *See*—
Schmid, Wolfgang; Wanner, Karl; Falchle, Jorg; Bleicher, Manfred; and Muller, Frank, 4,537,264, Cl. 173-48.000.

Blizzard, John D.; and Swihart, Terence J., to Dow Corning Corporation. Curable silicone compositions comprising resins. 4,537,829, Cl. 428-429.000.

Block, William V.: *See*—
Mahoney, Dennis F.; and Block, William V., 4,537,705, Cl. 252-529.000.

Blum, David B.; and Gelbein, Abraham P. Activation of catalysts for synthesizing methanol from synthesis gas. 4,537,876, Cl. 502-342.000.

Blumensaadt, Hans C., to Gottlieb Weinmann Gerate fur Medizin und Arbeitsschutz G.m.b.H. & Co. Pump element of a device for artificial respiration. 4,537,191, Cl. 128-205.130.

Board of Regents, University of Texas System, The: *See*—
Morrow, Robert M.; Kuebker, William A.; and McGinity, James W., 4,537,689, Cl. 252-11.000.

Bock, Edward C.: *See*—
Ritter, Joachim A.; Bock, Edward C.; Spinelli, Richard A.; and Dennis, John R., 4,537,499, Cl. 355-58.000.

Bock, Robert E., to WPM, Inc. Stream-controlling device for faucets. 4,537,360, Cl. 239-553.300.

Boden, Richard M.: *See*—
Sprecker, Mark A.; Wiegers, Wilhelmus J.; Belko, Robert P.; and Boden, Richard M., 4,537,704, Cl. 252-522.00R.

Boeck, LaVerne D.; Clem, Gladys M.; Hershberger, Charles L.; Anderson, Marie T.; and Michel, Karl H., to Eli Lilly and Company. Glycopeptide antibiotic CUC/CSV and process for its production. 4,537,715, Cl. 260-112.50R.

Boeing Company, The: *See*—
Foster, Clark B., 4,537,647, Cl. 156-245.000.
Miller, Dale D.; and Polky, John N., 4,537,502, Cl. 356-5.000.

Bogh, Ronald L.: *See*—
Caywood, Clayton D.; and Bogh, Ronald L., 4,536,989, Cl. 47-46.000.

Bohr, Mark T.; Yu, Ken K.; Yau, Leo D.; and Garg, Shyam G., to Intel Corporation. CMOS process for fabricating integrated circuits, particularly dynamic memory cells with storage capacitors. 4,536,947, Cl. 29-576.00C.

Boie, Immo; Luhrig, Hermann; and Kovacic, Guido, to *A*.gfa-Gevaert Aktiengesellschaft. Apparatus for the exposure and development of photographic images. 4,537,486, Cl. 354-317.000.

Boiron, Christian: *See*—
Boiron, Jean; Boiron, Christian; Abecassis, Jacky; and Favier, Andre-Marcel, 4,537,512, Cl. 366-132.000.

Boiron, Jean; Boiron, Christian; Abecassis, Jacky; and Favier, Andre-Marcel, to Laboratoires Boiron. Method and apparatus for Korsakovian dilution. 4,537,512, Cl. 366-132.000.

Boldt Industries, Inc.: *See*—
Amersfoort, Andre G., 4,536,920, Cl. 17-46.000.

Bolger, Thomas V., to RCA Corporation. Digital signal peaking apparatus with controllable peaking level. 4,538,178, Cl. 358-166.000.

Bollinger, Heinrich: *See*—
Muller, Hans-Rudolf; and Bollinger, Heinrich, 4,537,714, Cl. 260-112.50R.

Bolt Beranek and Newman Inc.: *See*—
Clemente, Anthony R., 4,538,139, Cl. 340-539.000.

Bolton, William W. Portable folding corral. 4,537,151, Cl. 119-20.000.

Bompard, Bruno P.; and Bruyere, Alain, to Commissariat a l'Energie Atomique; and Societe J. Brochier & Fils. Process and machine for inserting points in a mandrel. 4,536,930, Cl. 29-33.00K.

Bone, George D., Jr., to Westinghouse Electric Corp. Self-calibration of stacked beam radar. 4,538,150, Cl. 343-17.700.

Bonnet, Yves A.: *See*—
Ballatore, Daniel; Bonnet, Yves A.; Ferry, Michel F.; and Jacquart, Christian A., 4,538,032, Cl. 179-170.00D.

Book, Ronald J.: *See*—
Wiacek, Marian; Markin, Charles; and Book, Ronald J., 4,537,841, Cl. 429-56.000.

Boorsma, Nancy B., to Pennwalt Corporation. Tamper resistant and tamper evident sealed end cartons. 4,537,309, Cl. 206-525.000.

Booth, Ian K.; and Cunnane, Francis J., III, to Ascoe Felts, Inc. Papermakers superimposed felt with voids formed by removing yarns. 4,537,816, Cl. 428-234.000.

Boothe, Nancy G.; and Potts, Anthony M., to Motorola, Inc. Belt clip assembly with a controlled failure mode. 4,536,925, Cl. 24-511.000.

Borbely, Gyula J.; Devuyst, Eric A.; Ettel, Victor A.; Mosoiu, Marcel A.; and Schitka, Konstantin J., to INCO Limited. Cyanide removal from aqueous streams. 4,537,686, Cl. 210-713.000.

Borchardt, Dieter. Lashing bar. 4,537,539, Cl. 410-77.000.

Borden Company, Limited, The: *See*—
Chan, Lock-Lim; and Lau, Patrick W., 4,537,807, Cl. 428-74.000.

Borg-Warner Corporation: *See*—
Giles, Oley; and Bragg, Duncan D., 4,537,385, Cl. 251-214.000.

Boro Recycling Center, Inc.: *See*—
Heimerich, Henry R., 4,537,361, Cl. 241-81.000.

Boroschewski, Gerhard; and Arndt, Friedrich, to Schering Aktiengesellschaft. Diurethanes and selective herbicidal agent containing them. 4,537,622, Cl. 71-108.000.

Borrelli, Nicholas F.; Hares, George B.; Smith, Dennis W.; and Wedding, Brent M., to Corning Glass Works. Colored photochromic glasses and method. 4,537,612, Cl. 65-30.110.

Bortolani, Ermanno; Brembilla, Sandro; and Vassarotti, Enzo, to W. R. Grace & Co., Cryovac Div. Vacuum packaging. 4,537,011, Cl. 53-509.000.

Bose, Amar G., to Bose Corporation. Fixed bandpass tone controlling. 4,538,298, Cl. 381-98.000.

Bose Corporation: *See*—
Bose, Amar G., 4,538,298, Cl. 381-98.000.

Boston University, Trustees of: *See*—
Oh, Se-Kyung, 4,537,712, Cl. 260-112.00R.

Bottenbruch, Ludwig: *See*—
Idel, Karsten; Ostlinning, Edgar; Koch, Wolfgang; Bottenbruch, Ludwig; and Heitz, Walter, 4,537,951, Cl. 528-388.000.

Boughton, Thomas T., to T. T. Boughton & Sons, Ltd. Transport frames for vehicles. 4,537,540, Cl. 410-82.000.

Boussemaer, Daniel: *See*—
Degoix, Bernard; Boussemaer, Daniel; and Allemand, Didier, 4,537,468, Cl. 350-96.210.

Boutellier, Roman, to Kern & Co. Ltd. Infrared objective system lens. 4,537,464, Cl. 350-1.400.

Bowers, David L. Data entry systems. 4,537,150, Cl. 119-14.170.

Boyd, Robert D.: *See*—
Summers, Mark A.; Hagen, Wilhelm F.; and Boyd, Robert D., 4,537,475, Cl. 350-448.000.

Bracco, Al M.; Edenfeld, Arthur R.; and Kotecha, Harish N., to International Business Machines Corporation. Method of making ROM/-PLA semiconductor device by late stage personalization. 4,536,944, Cl. 29-571.000.

Braddick, Britt O. Arrangement to prevent premature expansion of expandable seal means. 4,537,251, Cl. 166-196.000.

Braehler, Hermann: *See*—
Thiel, Rudolf; Weisbrod, Helmut; and Braehler, Hermann, 4,537,291, Cl. 188-73.380.

Bragg, Duncan D.: *See*—
Giles, Oley; and Bragg, Duncan D., 4,537,385, Cl. 251-214.000.

Bralorne Resources Limited: *See*—
Krepela, Josef; and Friedrich, Jaromir, 4,537,386, Cl. 251-302.000.

Bramwell, Frank; and DeSouza, John, to United Technologies Corporation. Grounding of a control rod extending through an opening in a structure. 4,538,019, Cl. 174-6.000.

Brandenstein, Manfred; and Hans, Rudiger, to SKF Kugellagerfabriken GmbH. Bearing arrangement for a driven wheel of a vehicle. 4,537,270, Cl. 180-70.100.

Brandes, Wilhelm; and Daum, Werner, to Bayer Aktiengesellschaft. Fungicidally active substituted oximinoacetanilides. 4,537,905, Cl. 514-521.000.

Brassoud, Gerard, to S. T. Dupont. Attachment device for a decorative article. 4,536,922, Cl. 24-265.00B.

Bray, Gilbert. Portable occasional table and seating. 4,537,443, Cl. 297-159.000.

Brearey, Nicholas J.; and Baumgarth, Rolf, to Knorr-Bremse GmbH. Hydraulic pressure actuated brake system for rail vehicles. 4,538,228, Cl. 364-426.000.

Bredbury, Seth K.; and Waterman, Harold J., Jr., to Colt Industries Operating Corp. Cylindrical rifle handguard assembly. 4,536,982, Cl. 42-71.00R.

Bredderman, David: *See*—
Bredderman, Theodore; Bredderman, Virginia; Bredderman, Kathryn; and Bredderman, David, 4,537,451, Cl. 312-6.000.

Bredderman, Kathryn: *See*—
Bredderman, Theodore; Bredderman, Virginia; Bredderman, Kathryn; and Bredderman, David, 4,537,451, Cl. 312-6.000.

Bredderman, Theodore; Bredderman, Virginia; Bredderman, Kathryn; and Bredderman, David. Hanging locker shelves. 4,537,451, Cl. 312-6.000.

Bredderman, Virginia: *See*—
Bredderman, Theodore; Bredderman, Virginia; Bredderman, Kathryn; and Bredderman, David, 4,537,451, Cl. 312-6.000.

Breen, Thomas B., to General Electric Company. Synchronism check relay. 4,538,197, Cl. 361-71.000.

Breisinger, Otto; and Burgbacher, Herbert, to Sulzer Brothers Limited. Lubricant distributor. 4,537,284, Cl. 184-7.400.

Brembilla, Sandro: *See*—
Bortolani, Ermanno; Brembilla, Sandro; and Vassarotti, Enzo, 4,537,011, Cl. 53-509.000.

Brendel, Richard; and Conrad, Herbert, to Geroh GmbH, Mechanische Systeme. Cable clamp. 4,536,921, Cl. 24-132.0WL.

Brennan, Robert J.; Meighen, Terrence; and Phillipson, Walter M., to Stewart Stamping Corporation. Jack for EMI/RFI shield terminating modular plug connector. 4,537,459, Cl. 339-143.00R.

Brereton, Colin, to Imperial Chemical Industries, PLC. Electrolytic cell. 4,537,672, Cl. 204-253.000.

Brian Watt Associates, Inc.: *See*—
Chen, Jade; Birdy, Jal N.; and Watt, Brian J., 4,537,532, Cl. 405-217.000.

Briggs, Stephen L.: *See*—
Barton, Russell L.; Briggs, Stephen L.; and Koppel, Gary A., 4,537,727, Cl. 260-455.00R.

Brinkhoff, Carl H.; and Scott, Gordon C., to Mine Safety Appliances Company. Riot faceshield assembly. 4,536,892, Cl. 2-424.000.

Briscoe, Milton R., to International Telephone and Telegraph Corporation. Programmable coding and decoding arrangement. 4,538,269, Cl. 371-22.000.

Brisson, Bruce A. Audio signal cable. 4,538,023, Cl. 174-115.000.

Bristol, William E.: *See*—
Gale, Ronald S.; Bristol, William E.; and Noonan, Carroll, 4,537,586, Cl. 493-220.000.

British Aerospace Public Limited Company: *See*—
Jackson, Graham; and Surawy, Ryszard, 4,537,075, Cl. 73-634.000.

British Aluminium Company plc, The: *See*—
Bryant, Greyham F.; Spooner, Peter D.; and Pearson, William K. J., 4,537,050, Cl. 72-8.000.

British Telecommunications: *See*—
Cox, William E.; and Hemmings, Kenneth L., 4,537,265, Cl. 175-19.000.

Britton, Walter. Splitter for electrical cable. 4,536,957, Cl. 30-90.400.

Brockhaus, Ernst, to Ed. Scharwachter GmbH & Co. KG. Torsion bar vehicle door hinge assembly with hold open mechanism. 4,536,918, Cl. 16-308.000.

Brockway, Patrick H.; Lehr, Howard C.; and George, Richard D., to ASC Incorporated. Vehicle with a convertible top. 4,537,440, Cl. 296-108.000.

Brown, Claude D., to BBC Industries Inc. Flame control system for heat exchanger. 4,537,345, Cl. 236-11.000.

Brown Group Recreational Products, Inc.: *See*—
Defibaugh, William L., 4,537,392, Cl. 272-85.000.

Brown, Merle S.; and Arzberger, William A., to Jet Spray Corp. Beverage dispenser with improved in-bowl whipper. 4,537,332, Cl. 222-190.000.

Brown, Patrick A.; and Murphy, William C. Conveyor lubricating apparatus. 4,537,285, Cl. 184-15.200.

Brown, Roger H.: *See*—
Little, Michael J.; Brown, Roger H.; Efron, Uzi; and Hoberg, Clarence P., 4,537,827, Cl. 428-409.000.

Brown, Vincent B.; Kozel, Charles A.; Scheitz, John T.; and Armando, John E., to Methode Electronics Inc. Electrical connector. 4,537,456, Cl. 339-99.00R.

Brown-Wensley, Katherine A.; and Sinclair, Robert A., to Minnesota Mining and Manufacturing Company. Polyhydridosilanes and their conversion to pyropolymers. 4,537,942, Cl. 528-12.000.

Brown, William F.: *See*—
Christiansen, David W.; Steffen, Jim M.; and Brown, William F., 4,537,741, Cl. 376-261.000.

Bruce, Duncan; and Conklin, Charles E., to Conklin Instrument Corporation. Data bridge with gating and/or testing. 4,538,033, Cl. 179-175.000.

Bruggeman, Bruce: *See*—
Ewing, Robert L.; Hughes, James S.; and Bruggeman, Bruce, 4,538,217, Cl. 362-375.000.

Brunner, Ernst, to TIBA AG Kochherdfabrik und Apparatebau. Combustion chamber for solid fuels. 4,537,141, Cl. 110-300.000.

Brunswick Corporation: *See*—
Petersen, Oscar J.; Barton, Ross J.; Dalke, Jack E.; Sheffield, Gerald W.; and Towle, Theodore, 4,537,384, Cl. 251-83.000.

Bruschtein, Fabio B.; Jahn, Robert G.; and Wittbrodt, Edwin L., to Dow Chemical Company, The. Structured latex particles which are film forming and a process for their preparation. 4,537,916, Cl. 523-201.000.

Brustle, Klaus: *See*—
Rock, Erich; and Brustle, Klaus, 4,536,917, Cl. 16-288.000.

Bruyere, Alain: *See*—
Bompard, Bruno P.; and Bruyere, Alain, 4,536,930, Cl. 29-33.00K.

Bryant, Greyham F.; Spooner, Peter D.; and Pearson, William K. J., to British Aluminium Company plc, The. Method of controlling a stand for rolling strip material. 4,537,050, Cl. 72-8.000.

Bryce, William D., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Silencer for high velocity gas flow. 4,537,277, Cl. 181-214.000.

Bubley, Henry J., to American Screen Printing Equipment Co. Automatic peel control mechanism. 4,537,126, Cl. 101-123.000.

Buccola, Anthony A. Nozzle positioner for automatic fuel tank. 4,537,437, Cl. 296-1.00C.

Budzinski, Roger R., to Park-Ohio Industries, Inc. Rotating induction heating apparatus. 4,538,041, Cl. 219-10.750.

Budzyn, Boleslaw L.; and Carlson, Charles E., to Allied Corporation. Two piece casting wheel. 4,537,239, Cl. 164-423.000.

Buettner, Egon: *See*—
Oppenlaender, Knut; Fikentscher, Rolf; Buettner, Egon; Slotman, Wilhelmus; Schwartz, Erich; and Mohr, Rudolf, 4,537,701, Cl. 252-344.000.

Buhler - Miag GmbH: *See*—
Gsponer, Arnold; Huber, Werner; and Petrovic, Milan, 4,537,302, Cl. 198-626.000.

Bujadoux, Karel; and Neyer, Jean-Marie, to Societe Chimique des Charbonnages S.A. Catalyst containing an aromatic silicon compound for the polymerization of ethylene. 4,537,868, Cl. 502-104.000.

Buku, Berniece. Frame for holding plastic bag. 4,537,376, Cl. 248-97.000.

Bulat, Bulent, to Dresser Industries, Inc. Photo transducer circuit for setting minimum and maximum current flow between power terminals. 4,538,063, Cl. 250-214.00R.

Bullock, Robert L., to Standard Car Truck Company. Radial trucks. 4,537,138, Cl. 105-168.000.

Buratovich, Prosper. Animal leash. 4,537,155, Cl. 119-109.000.

Burgbacher, Herbert: *See*—
Breisinger, Otto; and Burgbacher, Herbert, 4,537,284, Cl. 184-7.400.

Burger, Arnulf; Scharff, Karl-Heinz; Geiger, Kurt; Schnee, Gunther; and Pieper, Hartwig, to BASF Aktiengesellschaft. Apparatus for treating flexible printing plates produced by photochemical methods. 4,536,909, Cl. 15-4.000.

Burleigh, John E.: *See*—
Uraneck, Carl A.; and Burleigh, John E., 4,537,932, Cl. 524-572.000.

Burnstead, Barry W.: *See*—
Rooke, David J.; and Burnstead, Barry W., 4,537,887, Cl. 514-197.000.

Burroughs Corp.: *See*—
Grow, Robert M., 4,538,147, Cl. 340-825.050.
Levin, Burton L.; Phelps, Andrew E.; and Potash, Hanan, 4,538,241, Cl. 364-900.000.

Burroughs, Robert H.; Wright, John D.; Secunda, Jeffrey A.; and Newbower, Ronald S., to Massachusetts General Hospital. Hand printer designed to enable a handicapped person to apply a signature to a document. 4,537,128, Cl. 101-407.0BP.

Bursa, Miloslav; Musil, Frantisek; and Podmela, Ladislav, to Prvni brnenska stojirna, koncernovy podnik. Gear transmission. 4,537,094, Cl. 74-804.000.

Burzin, Klaus: *See*—
Bartmann, Martin; Bax, Hanns-Jorg; Burzin, Klaus; and Ribbing, Wilfried, 4,537,948, Cl. 528-215.000.

Bussink, Jan; DeMunck, Johannes W. J.; and Marie van Abeelen, Petrus C. A., to General Electric Company. Composition of a polycarbonate resin and a selectively hydrogenated copolymer of a vinyl aromatic compound and an olefinic elastomer. 4,537,930, Cl. 524-505.000.

Butler, James R.; and Watson, James M., to Cosden Technology, Inc. Conversion of paraffins to aromatics. 4,538,017, Cl. 585-415.000.

Butler, James R., to Precision Monolithics, Inc. JFET Differential amplifier stage with method for controlling input current. 4,538,115, Cl. 330-253.000.

Buttinoni, Ada: *See*—
Doria, Gianfederico; Passarotti, Carlo; and Buttinoni, Ada, 4,537,962, Cl. 544-255.000.

Butts, Dennis D. Air vehicle having driven wheels and ducted fans. 4,537,373, Cl. 244-22.000.

Buxel, Ludwig M.; and Mulhaus, Ludwig, to Uhde GmbH. Process of and apparatus for reheating and conveying a granular heat carrier. 4,537,571, Cl. 432-27.000.

Buys, Romain J. B.; and Manouvrier, Jean-Aime . Method for treating the surface of a concrete slab. 4,537,796, Cl. 427-136.000.

Cableform Limited: *See*—
Stevens, Keith D.; Harrison, John; and Kaye, Stanley B., 4,538,171, Cl. 357-81.000.

Cadiergue, Joseph: *See*—
Tessier, Jean; Demoute, Jean-Pierre; and Cadiergue, Joseph, 4,537,897, Cl. 514-351.000.

Cagles', Inc.: *See*—
Cashwell, Miles L.; and Peterman, Worthy D., 4,536,919, Cl. 17-11.000.

Caillot, Luc; and Chopin, Claude, to SYNTHELABO. Process and device for controlling artificial respiration. 4,537,190, Cl. 128-204.220.

Caithness, Michael G.: *See*—
White, James N. J.; and Caithness, Michael G., 4,538,192, Cl. 360-98.000.

Calder, Oliver J., to Graham, Phyllis. Spray tip. 4,537,355, Cl. 239-119.000.

Cambridge Filter Corporation: *See*—
Elbers, Richard W., 4,537,812, Cl. 428-182.000.

Cameron, Donald S., to Johnson Matthey Public Limited Company. Fuel cell and method of purging a fuel cell. 4,537,839, Cl. 429-20.000.

Cameron Iron Works, Inc.: *See*—
Troxell, John N., Jr., 4,537,250, Cl. 166-55.000.

Campbell, Curtis B., to Chevron Research Company. Lubricating oil compositions containing methylol polyether amino ethanes. 4,537,693, Cl. 252-51.50R.

Canadian General Electric Company Limited: *See*—
Ferguson, Donald K., 4,538,202, Cl. 361-124.000.

Canon Kabushiki Kaisha: *See*—
Masuda, Shunichi, 4,537,497, Cl. 355-14.00R.
Saito, Seiji; Ayata, Naoki; Suzuki, Hidetoshi; Ozawa, Kunitaka; and Koumura, Noboru, 4,538,182, Cl. 358-280.000.
Suzuki, Ryoichi; and Tokuda, Ryuji, 4,537,489, Cl. 354-403.000.

Cappon, John. Time domain reflectometer apparatus for identifying the location of cable defects. 4,538,103, Cl. 324-52.000.

Caray, Andre : *See*—
Loizeau, Pierre; and Caray, Andre , 4,537,580, Cl. 464-68.000.

Carborundum Abrasives Company: *See*—
Radmore, Robert R.; and Hall, John T., 4,537,368, Cl. 242-58.600.

Carey, John C. Control apparatus. 4,538,134, Cl. 337-113.000.

Carle, Glenn C.; Kojiro, Daniel R.; and Humphry, Donald E., to United States of America, National Aeronautics and Space Administration. Modulated voltage metastable ionization detector. 4,538,066, Cl. 250-374.000.

Carlson, Charles E.: *See*—
Budzyn, Boleslaw L.; and Carlson, Charles E., 4,537,239, Cl. 164-423.000.

Carstensen, Jes: *See*—
Nau, Walter; and Carstensen, Jes, 4,537,423, Cl. 280-759.000.

Carter, Cecil O., to Phillips Petroleum Company. Surface conditioning in olefin dimerization reactors. 4,538,018, Cl. 585-512.000.

Carter, J. Warne, Sr., to Ameron Inc. Couplings for non-ferrous pipe. 4,537,426, Cl. 285-110.000.

Carter, John L.; Markowsky, George; and Wegman, Mark N., to International Business Machines Corporation. Method and apparatus for performing hashing operations using Galois field multiplication. 4,538,240, Cl. 364-754.000.

Carver, Herman C. Downhole retrieval tool. 4,537,435, Cl. 294-86.100.

Cascade Steel Rolling Mills, Inc.: *See*—
Caywood, Clayton D.; and Bogh, Ronald L., 4,536,989, Cl. 47-46.000.

Casci, John L.; Lowe, Barrie M.; and Whittam, Thomas V., to Imperial Chemical Industries PLC. Zeolite EU-1 and a method of making zeolite EU-1. 4,537,754, Cl. 423-277.000.

Cashwell, Miles L.; and Peterman, Worthy D., to Cagles', Inc. Breast processor. 4,536,919, Cl. 17-11.000.

Casio Computer Co.: *See*—
Sakurai, Keiichi; Ishida, Hideaki; and Hanzawa, Kohtaro, 4,537,110, Cl. 84-1.260.

Castaldi, Graziano; and Giordano, Claudio, to Zambon S.p.A. Alpha-substituted-alkylarylketals particularly useful for preparing alpha-arylalkanoic acids. 4,537,979, Cl. 549-347.000.

Castaneda, Henry B., to Chemetrics, Inc. Disposable device for sampling and diluting. 4,537,747, Cl. 422-100.000.

Castellano, Gary M.; and Alto, Kenneth W. Broadhead arrow head structure. 4,537,404, Cl. 273-422.000.

Caterpillar Tractor Co.: *See*—
Heinrich, Andrew L.; and Oljace, Richard L., 4,538,036, Cl. 200-11.0EA.
Marsh, John D.; and Nazzer, Craig A., 4,538,086, Cl. 310-258.000.
Satzler, Ronald L., 4,537,267, Cl. 180-9.100.

Cavestany, Adrian V.; and Zimmerman, Alan R., to Coleman Company, Inc., The. Fresh air device for mobile home or other dwelling. 4,537,117, Cl. 98-39.100.

Caviness, Robert J. Self-propelled, preprogrammable fishing lure. 4,536,985, Cl. 43-17.600.

Cawlfield, David W.; Moore, William M.; and Stubbs, John L., Jr., to Olin Corporation. Chelating resin and process for making same. 4,537,937, Cl. 525-417.000.

Caywood, Clayton D.; and Bogh, Ronald L., to Cascade Steel Rolling Mills, Inc. Cross arm unit. 4,536,989, Cl. 47-46.000.

Cegedur Societe de Transformation de L'Aluminim Pechiney: *See*—
Eudier, Michel; Huret, Noel; and Meunier, Jean, 4,537,167, Cl. 123-193.00C.

Cegedur Societe de Transformation de l'Aluminium Pechiney: *See*—
Huret, Noel; and Meunier, Jean, 4,537,161, Cl. 123-41.710.

Ceisel, Stephen G.: *See*—
Kilner, Peter H.; Egan, Joseph P., Jr.; Ceisel, Stephen G.; and Schammel, Wayne P., 4,537,978, Cl. 549-245.000.

Celanese Corporation: *See*—
Gillberg-La Force, Gunilla E.; and Kravas, Helen A., 4,537,931, Cl. 524-510.000.
Linstid, H. Clay, III; and Koermer, Gerald S., 4,537,995, Cl. 568-384.000.

Cerini, Costantino P., to American Cyanamid Company. Stabilization of influenza virus vaccine. 4,537,769, Cl. 424-89.000.

Cerutti, Rosanna. Steam ironing appliance. 4,536,978, Cl. 38-103.000.

Chacon, M. Frank: *See*—
Bielinski, Ralph F.; Chacon, M. Frank; Kramer, Dennis M.; Mathias, William R.; and Schneider, Stanley, 4,538,199, Cl. 361-93.000.

Chan, Fred N., to Ford Aerospace & Communications Corporation. Method and apparatus for thruster transient control. 4,537,375, Cl. 244-171.000.

Chan, Lock-Lim; and Lau, Patrick W., to Borden Company, Limited, The. Binder for pre-moistened paper products. 4,537,807, Cl. 428-74.000.

Chandler Evans, Inc.: *See*—
Cropper, George D.; and Gentile, Anthony J., 4,537,025, Cl. 60-39.281.

Chang, Chin-An; Chang, Leroy L.; Esaki, Leo; and Mendez, Emilio E., to International Business Machines Corporation. FET With heterojunction induced channel. 4,538,165, Cl. 357-22.000.

Chang, Clarence D.: *See*—
Miale, Joseph N.; and Chang, Clarence D., 4,538,014, Cl. 585-408.000.
Miale, Joseph N.; and Chang, Clarence D., 4,538,015, Cl. 585-408.000.
Miale, Joseph N.; and Chang, Clarence D., 4,538,016, Cl. 585-408.000.

Chang, Irving B.; and Beckwith, Robert E., Jr., to Allied Corporation. Sulfur stabilized oxidized polyolefin composition. 4,537,922, Cl. 524-82.000.

Chang, Leroy L.: *See*—
Chang, Chin-An; Chang, Leroy L.; Esaki, Leo; and Mendez, Emilio E., 4,538,165, Cl. 357-22.000.

Chang, Michael N.; Hammond, Milton L.; Jensen, Norman P.; McDonald, John; and Zambias, Robert A., to Merck & Co., Inc. Substituted cinnamyl-2,3-dihydrobenzofuran and analogs useful as anti-inflammatory agents. 4,537,903, Cl. 514-456.000.

Chao, Pane-Chane; and Ku, Walter H., to Cornell Research Foundation, Inc. Fabrication of T-shaped metal lines for semiconductor devices. 4,536,942, Cl. 29-571.000.

Charles Beseler Company: *See*—
Nemesnyik, John C., 4,537,500, Cl. 355-67.000.

Charles Stark Draper Laboratory, Inc., The: *See*—
Whitney, Daniel E., 4,537,557, Cl. 414-735.000.

Charles Wyle Engineering Corporation: *See*—
Wyle, Charles; Shea, Donald M.; and Best, Norman D., 4,536,935, Cl. 29-281.100.

Charney, Joseph C.; Goodman, Phillip M.; and Morgan, Robert H., to EPR Corporation. Paint dispensing applicator with safety features. 4,537,522, Cl. 401-218.000.

Chemetrics, Inc.: *See*—
Castaneda, Henry B., 4,537,747, Cl. 422-100.000.

Chemie und Filter GmbH Verfahrenstechnik KG: *See*—
Edler, Friedrich, 4,537,565, Cl. 417-413.000.

Chemische Werke Huels, AG: *See*—
Rombusch, Konrad; Maahs, Gunther; and Schafer, Wolfgang, 4,537,924, Cl. 524-103.000.

Chemische Werke Huls AG: *See*—
Bartmann, Martin; Bax, Hanns-Jorg; Burzin, Klaus; and Ribbing, Wilfried, 4,537,948, Cl. 528-215.000.
Donike, Wilhelm; Ulrich, Helmut; Thiemer, Heinz; and Pieper, Josefa, 4,538,013, Cl. 585-361.000.

Chemplex Company: *See*—
Adur, Ashok M.; Schmukler, Seymour; Maconis, John, Jr.; and Shida, Mitsuzo, 4,537,836, Cl. 428-522.000.

Chen, Jade; Birdy, Jal N.; and Watt, Brian J., to Brian Watt Associates, Inc. Composite load bearing outer skin for an arctic structure and a method for erecting same. 4,537,532, Cl. 405-217.000.

Chen, Ying-Ho: *See—*
Lunsford, Carl D.; and Chen, Ying-Ho, 4,538,001, Cl. 568-633.000.
Chenoweth, Terrence E.: *See—*
Dakin, Thomas W.; Studniarz, Stanley A.; and Chenoweth, Terrence E., 4,537,803, Cl. 427-385.500.
Cheskis, Harvey P.: *See—*
Tyler, Derek E.; Cheskis, Harvey P.; and Tungatt, Paul D., 4,537,627, Cl. 75-76.000.
Chevron Research Company: *See—*
Campbell, Curtis B., 4,537,693, Cl. 252-51.50R.
Elson, Thomas D.; and Millhone, Ralph S., 4,537,254, Cl. 166-278.000.
Feldman, Richard B., 4,538,141, Cl. 340-604.000.
Gouw, T. H., 4,537,605, Cl. 55-48.000.
Marcantonio, Paul J., 4,537,751, Cl. 423-114.000.
Miller, Stephen J., 4,538,012, Cl. 585-255.000.
Ward, Carl E., 4,537,623, Cl. 71-90.000.
Chevron Research Company, Inc.: *See—*
Platt, James L., Jr.; and Ellis, John R. B., 4,536,973, Cl. 34-182.000.
Chikami, Michio: *See—*
Okamoto, Eiji; Fukaya, Yasuhiro; and Chikami, Michio, 4,537,247, Cl. 165-104.140.
Chisso Corporation: *See—*
Ogawa, Tetsuya; Saitoh, Shinichi; Inoi, Takeshi; Kato, Masaji; and Obara, Heitaro, 4,537,999, Cl. 568-584.000.
Chiyoda Chem. Engineering & Constr. Co.: *See—*
Tajima, Hiroto; Kawakami, Hironori; Mashino, Zenichi; Hayami, Seinoshin; and Ohzeki, Osamu, 4,537,600, Cl. 44-51.000.
Chonde, Yohannes, to Dow Chemical Company, The. Interface beads for mixed-bed ion exchange resins. 4,537,911, Cl. 521-28.000.
Chono, Masazumi; and Ishida, Hiroshi, to Asahi Kasei Kogyo Kabushiki Kaisha. Crystalline aluminosilicate AZ-1 and a process for producing the same. 4,537,757, Cl. 423-328.000.
Chopin, Claude: *See—*
Caillot, Luc; and Chopin, Claude, 4,537,190, Cl. 128-204.220.
Chou, Ta-Sen, to Eli Lilly and Company. Crystalline cephalosporin antibiotic salt. 4,537,959, Cl. 544-025.000.
Christensen, Inc.: *See—*
Illerhaus, Roland; and Jurgens, Rainer, 4,537,097, Cl. 76-108.00A.
Christensen, Richard M.: *See—*
Kulkarni, Satish V.; Christensen, Richard M.; and Toland, Richard H., 4,537,091, Cl. 74-572.000.
Christiansen, David W.; Steffen, Jim M.; and Brown, William F., to United States of America, Energy. Funnel for fuel pin loading system. 4,537,741, Cl. 376-261.000.
Christiansen, John A., to MTS Systems Corporation. Side loading specimen grip. 4,537,080, Cl. 73-857.000.
Christophliemk, Peter: *See—*
Greb, Wolfgang; Christophliemk, Peter; and Schroder, Christine, 4,537,771, Cl. 424-154.000.
Chu, Arthur S.: *See—*
Bart, Edward F.; Chu, Arthur S.; and Cook, George R., 4,537,635, Cl. 106-277.000.
Chu, Pochen; and Kuehl, Guenter H., to Mobil Oil Corporation. Process for preparing highly siliceous porous ZSM-12 type crystalline material. 4,537,758, Cl. 423-329.000.
Ciba-Geigy Corporation: *See—*
Fischer, Walter; and Zweifel, Hans, 4,537,977, Cl. 549-243.000.
Irving, Edward, 4,537,725, Cl. 556-138.000.
Lohse, Friedrich; and Zondler, Helmut, 4,537,946, Cl. 528-118.000.
Meyer, Willy; and Fory, Werner, 4,537,619, Cl. 71-93.000.
Schaetzer, Harry; Raisin, Helmut; and Mausezahl, Dieter, 4,537,598, Cl. 8-641.000.
Schurter, Rolf; Fory, Werner; and Meyer, Willy, 4,537,618, Cl. 71-92.000.
Slongo, Mario; and Karrer, Friedrich, 4,537,923, Cl. 524-100.000.
Watthey, Jeffrey W. H., 4,537,885, Cl. 514-183.000.
CIC Int'l Corp.: *See—*
Levine, Morris M., 4,536,914, Cl. 15-344.000.
Cii Honeywell Bull (Societe Anonyme): *See—*
Ugon, Michel; and Fouchard, Serge, 4,538,058, Cl. 235-380.000.
Cincinnati Milacron Inc.: *See—*
Resnick, Brian J.; Messina, Elena R.; Bhatia, Madhukar; and Holmes, John G., 4,538,233, Cl. 364-513.000.
Circello, Joseph C., to Honeywell Information Systems Inc. Method and apparatus for calculating the residue of a binary number. 4,538,237, Cl. 364-746.000.
Circello, Joseph C.; and Guenthner, Russell W., to Honeywell Information Systems Inc. Method and apparatus for calculating the residue of a signed binary number. 4,538,238, Cl. 364-746.000.
Citizen Watch Company Limited: *See—*
Shimizu, Masami; Yoshikawa, Hisao; Kimura, Sosaku; Shiba, Kazuo; Maeno, Fumio; Fuwa, Shigehiro; and Mihara, Kuniyuki, 4,536,993, Cl. 51-165.800.
Ciupke, Werner W.: *See—*
Danby, Hal C.; and Ciupke, Werner W., 4,537,387, Cl. 251-331.000.
Claber S.p.A.: *See—*
Roman, Gianfranco, 4,537,215, Cl. 137-355.260.
Claeson, Carl G.; and Gustavsson, Stig I., to KabiVitrum AB. Thrombin inhibiting arylsulfonyl guanidinophenylalanine amides. 4,537,896, Cl. 514-330.000.
Clarion Co., Ltd.: *See—*
Ito, Tsukasa, 4,538,143, Cl. 340-719.000.
Clark, Alan D. Dental articulator. 4,537,574, Cl. 433-69.000.
Clark, Allen J.; and Maue, Dale N., to MTS Systems Corporation. Load dynamics compensation circuit for servohydraulic control systems. 4,527,077, Cl. 73-665.000.
Clark, Brian, to Schlumberger Technology Corporation. Apparatus and method for electromagnetic logging with reduction of spurious modes. 4,538,109, Cl. 324-338.000.
Clark Equipment Company: *See—*
Roney, Thomas W.; and Adams, Maynard L., 4,537,446, Cl. 297-464.000.
Clark, Robert W., Jr. Thermally powered heat transfer systems utilizing sequential displacement. 4,537,037, Cl. 62-116.000.
Clark, Robert W., III. Thermally powered heating system. 4,537,036, Cl. 62-116.000.
Clark, Ronald M. Spatula type hand tool. 4,536,910, Cl. 15-104.00S.
Clegg, Michael W.: *See—*
Harwood, Jon W.; Clegg, Michael W.; and Treadwell, Mark C., 4,537,027, Cl. 60-323.000.
Clem, Gladys M.: *See—*
Boeck, LaVerne D.; Clem, Gladys M.; Hershberger, Charles L.; Anderson, Marie T.; and Michel, Karl H., 4,537,715, Cl. 260-112.50R.
Clemente, Anthony R., to Bolt Beranck and Newman Inc. Signalling apparatus. 4,538,139, Cl. 340-539.000.
Clinkenbeard, Ivan L.: *See—*
Lawhorn, William S.; and Clinkenbeard, Ivan L., 4,537,371, Cl. 244-3.220.
Clipper, Donald; and Norfleet, James, to Colgate-Palmolive Company. Oral preparation. 4,537,778, Cl. 424-53.000.
Cluniat, Claude, to LGT Laboratoire General des Telecommunications. System for non linearity correction by intermediate frequency premodulation in television equipment. 4,538,180, Cl. 358-186.000.
Coates, Fredrica V. Adjustable diaper with a backband and fastening protection means. 4,537,591, Cl. 604-391.000.
Coca-Cola Company, The: *See—*
Hunter, George L. K.; Dennison, Daniel B.; and Stephens, Charles E., 4,537,637, Cl. 127-60.000.
Coe, Jerry R.; Pearce, Godfrey R.; and See, Francis R., to Emhart Industries, Inc. Anchoring apparatus for a capacitor. 4,538,025, Cl. 174-52.00S.
Cogan, Uri: *See—*
Schachter, David; Abbott, Richard E.; and Cogan, Uri, 4,537,718, Cl. 260-112.50R.
Cohen, Eli. Shoe with deflective and compressionable mid-sole. 4,536,974, Cl. 36-28.000.
Cohen, Sabatino, to Saint-Gobain Vitrage. Semi-reflective glazing comprising a nickel-chromium-molybdenum alloy anchoring layer. 4,537,798, Cl. 427-166.000.
Coiner, Russell E.; and Moore, Thomas W., to Virginia Panel Corporation. Spring contact holding shell having integral wire wrap post. 4,537,463, Cl. 339-276.00A.
Colburn, Richard P., to United States of America, Energy. Fission gas detection system. 4,537,740, Cl. 376-256.000.
Cole, Geoffrey V., to United Kingdom Atomic Energy Authority, The. Manipulator. 4,537,547, Cl. 414-5.000.
Coleman Company, Inc., The: *See—*
Cavestany, Adrian V.; and Zimmerman, Alan R., 4,537,117, Cl. 98-39.100.
Colgate-Palmolive Company: *See—*
Clipper, Donald; and Norfleet, James, 4,537,778, Cl. 424-53.000.
Gaffar, Abdul; Davis, Calvin B.; Donohue, John J.; and Moy, Debbie, 4,537,765, Cl. 424-53.000.
Collins, Earl R., Jr., to United States of America, National Aeronautics and Space Administration. Shuttle car loading system. 4,537,554, Cl. 414-328.000.
Collins, Kent L.: *See—*
Lewis, George A.; Collins, Kent L.; Benesh, Joseph C.; and Ward, Patrick C., 4,538,091, Cl. 313-625.000.
Colt Industries Operating Corp.: *See—*
Bredbury, Seth K.; and Waterman, Harold J., Jr., 4,536,982, Cl. 42-71.00R.
Columbia University in the City of New York: *See—*
Schachter, David; Abbott, Richard E.; and Cogan, Uri, 4,537,718, Cl. 260-112.50R.
Colvin, Howard A.; Muse, Joel, Jr.; and Hollingshead, William S., to Goodyear Tire & Rubber Company, The. Process for the production of hydroxyanisole and alkylated hydroxyanisoles. 4,538,002, Cl. 568-650.000.
Combs, Linsey L., to W.W.B. Developers. Wire rope spare tire carrier. 4,537,555, Cl. 414-463.000.
Commissariat a l'Energie Atomique: *See—*
Bardoux, Raymond; and Joffre, Henri, 4,538,071, Cl. 250-505.100.
Bompard, Bruno P.; and Bruyere, Alain, 4,536,930, Cl. 29-33.00K.
Gaussens, Gilbert; and Lemaire, Francis, 4,537,668, Cl. 204-159.170.
Communications Patents Limited: *See—*
Gargini, Eric J.; and Baker, Henry L., 4,538,174, Cl. 358-86.000.
Confer, Richard G., to American Sterilizer Company. Mask/microphone system for voice actuated control. 4,537,276, Cl. 181-21.000.
Conklin, Charles E.: *See—*
Bruce, Duncan; and Conklin, Charles E., 4,538,033, Cl. 179-175.000.
Conklin Instrument Corporation: *See—*
Bruce, Duncan; and Conklin, Charles E., 4,538,033, Cl. 179-175.000.

Connor, Philip J.: *See—*
Lersmacher, Bernhard; Wassall, Michael P.; and Connor, Philip J., 4,537,506, Cl. 356-312.000.
Conoco Inc.: *See—*
Gergely, John S., 4,538,278, Cl. 372-70.000.
Reust, Dennis K.; and Gergely, John S., 4,538,230, Cl. 364-433.000.
Conrad, Herbert: *See—*
Brendel, Richard; and Conrad, Herbert, 4,536,921, Cl. 24-132.0WL.
Container Corporation of America: *See—*
Everman, Wayne F.; Lewis, D. Michael; and Russell, Raymond L., 4,537,584, Cl. 493-93.000.
Continental Emsco Company: *See—*
Vroonland, Evart. J.; and Curtis, William M., 4,537,233, Cl. 141-387.000.
Continental-Wirt Electronics Corp.: *See—*
Worth, Sidney V., 4,537,458, Cl. 339-143.00R.
Control Data Corporation: *See—*
Shambroom, John R.; and Sliski, Alan P., 4,538,069, Cl. 250-491.100.
Conver Corporation: *See—*
Lloyd, Robert H. F., 4,537,246, Cl. 165-80.00B.
Convergent Technologies, Inc.: *See—*
Freige, Diab E.; Lockwood, John J.; Ramsay, Michael; and Keely, Leroy B., 4,538,073, Cl. 307-33.000.
Cook, George R.: *See—*
Bart, Edward F.; Chu, Arthur S.; and Cook, George R., 4,537,635, Cl. 106-277.000.
Cook, Richard T.: *See—*
Taylor, Andrew W.; and Cook, Richard T., 4,537,886, Cl. 514-193.000.
Cooke, Horise M., to Stratoflex, Inc. Clip for a fluid coupling. 4,537,427, Cl. 285-305.000.
Cooke, Theodore M.; Lin, Robert A.; Whitfield, Richard G.; and Hock, Allan G., to Exxon Research and Engineering Co. Ink jet ink formulation for reduced start-up problems. 4,537,631, Cl. 106-22.000.
Coons, Robert A., Jr., to Xerox Corporation. Sheet binding apparatus. 4,537,650, Cl. 156-384.000.
Cooper, Eugene R., to Procter & Gamble Company, The. Penetrating topical pharmaceutical compositions containing N-(2-hydroxyethyl) pyrrolidone. 4,537,776, Cl. 514-424.000.
Copeland Corporation: *See—*
Blass, Jaroslav; and Deal, Michael A., 4,537,566, Cl. 417-569.000.
Corbett, Sue. Electrode cap. 4,537,198, Cl. 128-639.000.
Cordis Corporation: *See—*
Tarjan, Peter P., 4,537,791, Cl. 427-2.000.
Core Laboratories, Inc.: *See—*
Barnaby, Harold T., 4,537,063, Cl. 73-38.000.
Corey, Frederick C.: *See—*
VonGrunberg, Hubertus; Rowell, Jonathan M.; and Corey, Frederick C., 4,537,289, Cl. 188-97.400.
Cornell Research Foundation, Inc.: *See—*
Chao, Pane-Chane; and Ku, Walter H., 4,536,942, Cl. 29-571.000.
Donaldson, William R.; and Tang, Chung L., 4,537,990, Cl. 564-63.000.
Corning Glass Works: *See—*
Borrelli, Nicholas F.; Hares, George B.; Smith, Dennis W.; and Wedding, Brent M., 4,537,612, Cl. 65-30.110.
Maschmeyer, Richard O., 4,537,473, Cl. 350-432.000.
Tick, Paul A., 4,537,864, Cl. 501-30.000.
Cosden Technology, Inc.: *See—*
Butler, James R.; and Watson, James M., 4,538,017, Cl. 585-415.000.
Coulter Systems Corporation: *See—*
Weber, Harold J., 4,538,204, Cl. 361-229.000.
Cowan, Arnold A., to Gem Products, Inc. Single seal pipeline tapping fixture having secure valve. 4,537,214, Cl. 137-318.000.
Cowher, Melvyn E.: *See—*
Shuskus, Alexander J.; and Cowher, Melvyn E., 4,537,651, Cl. 156-613.000.
Cox, William E.; and Hemmings, Kenneth L., to British Telecommunications. Self propelled reversible boring ram. 4,537,265, Cl. 175-19.000.
Coyle, Joseph P.: *See—*
Tsang, Peter H.; Coyle, Joseph P.; Liu, Tung; and VanderPoorte, John G., 4,537,823, Cl. 428-308.400.
Cragoe, Edward J., Jr.; Rooney, Clarence S.; and Williams, Haydn W. R., to Merck & Co., Inc.; and Merck Sharp & Dohme (I.A.) Corp. 4-Substituted-3-hydroxy-3-pyrroline-2,5-dione inhibitors of glycolic acid oxidase. 4,537,902, Cl. 514-422.000.
Crain, Stephen F.; Gray, Steven H.; Arnold, Edward P.; and Dodd, Timothy J., to Halliburton Company. Apparatus and method for mixing a plurality of substances. 4,538,221, Cl. 364-172.000.
Crain, Stephen F.; Gray, Steven H.; Green, Michael L.; and Gibson, Ronald A., to Halliburton Company. Apparatus and method for mixing a plurality of substances. 4,538,222, Cl. 364-172.000.
Creative Products Resource Associates, Ltd.: *See—*
Smith, James A.; and Murphy, Betty J., 4,537,914, Cl. 521-111.000.
Creative Technology, Inc.: *See—*
Tuten, William J.; Crosby, Kennith D.; and Bergquist, Bertil R., 4,538,100, Cl. 318-808.000.
Credo Stahlwarenfabrik Gustav Kracht, Firma: *See—*
Gilhaus, Heinz, 4,537,207, Cl. 132-76.400.
Crivello, James V., to General Electric Company. Photoresist compositions and method. 4,537,854, Cl. 430-283.000.
Cropper, George D.; and Gentile, Anthony J., to Chandler Evans, Inc. Electronic fuel control with manual training mode. 4,537,025, Cl. 60-39.281.
Crosby, Kennith D.: *See—*
Tuten, William J.; Crosby, Kennith D.; and Bergquist, Bertil R., 4,538,100, Cl. 318-808.000.
Crouch, Michael D. Method for controlled reduction in temperature and preservation of embryos in a cryogenic state. 4,537,034, Cl. 62-62.000.
Crowe, Anthony. Method and equipment for processing a plasticizable material. 4,537,737, Cl. 264-40.400.
Cselt Centro Studi e Laboratori Telecommunicazioni SpA: *See—*
Gabrielli, Luciano; and Sposini, Maurizio, 4,538,263, Cl. 370-86.000.
CSELT Centro Studi e Laboratori Telecomunicazioni SPA: *See—*
Giusto, Pietro P., 4,538,111, Cl. 329-122.000.
Csongor, Eva: *See—*
Kreidl, Janos; Farkas nee Kirjak, Maria; Harsanyi, Kalman; Benke, Bela ; Rado, Andras; Domany, Gyorgy; Hegedus, Bela; Csongor, Eva; Deutsch nee Juhasz, Ida; and Petho, Hajnalka, 4,537,900, Cl. 514-400.000.
Culbertson, Samuel W.; and Dixon, George, to Binks Manufacturing Company. Spray guns. 4,537,357, Cl. 239-290.000.
Culligan International Company: *See—*
Norton, William W., 4,537,329, Cl. 220-465.000.
Cunnane, Francis J., III: *See—*
Booth, Ian K.; and Cunnane, Francis J., III, 4,537,816, Cl. 428-234.000.
Cunningham, Franklin E.: *See—*
Proctor, Valerie A.; and Cunningham, Franklin E., 4,537,788, Cl. 426-614.000.
Cuomo, Jerome J.; Harper, James M. E.; and Waters, Gary A., to International Business Machines Corporation. Single grid focussed ion beam source. 4,538,067, Cl. 250-396.00R.
Curtis, William M.: *See—*
Vroonland, Evart. J.; and Curtis, William M., 4,537,233, Cl. 141-387.000.
Cutter, James W. X-ray film cassette holder. 4,538,293, Cl. 378-181.000.
Cymbler, Murray J., to Astro-Stream Corporation, The. Aerial recreation device. 4,537,405, Cl. 273-428.000.
Dabonde, James T. Cartridge decapping tool. 4,537,112, Cl. 86-37.000.
Daicel Chemical Industries, Ltd.: *See—*
Kojima, Hidetaka; Horikawa, Takeshi; and Kagotani, Masahiro, 4,537,997, Cl. 568-454.000.
Daimler-Benz Aktiengesellschaft: *See—*
Stolz, Albert, 4,537,349, Cl. 237-12.30C.
Dakin, Thomas W.; Studniarz, Stanley A.; and Chenoweth, Terrence E., to Westinghouse Corp. Resins containing a low viscosity organopolysiloxane liquid dielectric and a method of insulating a conductor therewith. 4,537,803, Cl. 427-385.500.
Dale, Paul B.: *See—*
Banks, Edwin R.; Ray, Roger C.; and Dale, Paul B., 4,538,225, Cl. 364-200.000.
D'Alelio, Gaetano F., to University of Notre Dame du Lac. Chain-extending functional polyimides by dipole reactions. 4,537,947, Cl. 525-424.000.
Dalke, Jack E.: *See—*
Petersen, Oscar J.; Barton, Ross J.; Dalke, Jack E.; Sheffield, Gerald W.; and Towle, Theodore, 4,537,384, Cl. 251-83.000.
Danby, Hal C.; and Ciupke, Werner W., to Anatros Corporation. Precision valve assembly. 4,537,387, Cl. 251-331.000.
Dantzig, Jonathan A.: *See—*
Pryor, Michael J.; Winter, Joseph; and Dantzig, Jonathan A., 4,537,242, Cl. 164-460.000.
Darling, Charles M., to Research Corporation. Pharmaceutically useful malonamides. 4,537,781, Cl. 514-616.000.
Darr, Robert E.: *See—*
Mojden, Wallace W.; and Darr, Robert E., 4,537,010, Cl. 53-447.000.
Mojden, Wallace W.; and Darr, Robert E., 4,537,550, Cl. 414-46.000.
Dart Industries Inc.: *See—*
Zieff, Mark P., 4,537,325, Cl. 220-234.000.
Daum, Werner: *See—*
Brandes, Wilhelm; and Daum, Werner, 4,537,905, Cl. 514-521.000.
Davenport, John M.: *See—*
Germano, Carmen P.; and Davenport, John M., 4,538,087, Cl. 310-332.000.
Davies, David A., to Automotive Products plc. Friction clutch driven plate. 4,537,297, Cl. 192-106.200.
Davis, Albert P., Jr.; and Robinson, Leon H., to Exxon Production Research Co. Connector for providing electrical continuity across a threaded connection. 4,537,457, Cl. 339-117.00P.
Davis, Calvin B.: *See—*
Gaffar, Abdul; Davis, Calvin B.; Donohue, John J.; and Moy, Debbie, 4,537,765, Cl. 424-53.000.
Dawson, Peter L., to Lever Brothers Company. Abrasive agglomerates for use in scouring cleaning compositions. 4,537,604, Cl. 51-298.000.
Day, Charles E.: *See—*
Balbes, Michael S.; Day, Charles E.; Hooper, Robert L.; and Lin, Hank S., 4,538,175, Cl. 358-86.000.
Day, Michael N.; and Miller, Claude D., to International Business Machines Corporation. Method and apparatus for instruction parity error recovery. 4,538,265, Cl. 371-12.000.
de la Bretoniere, Andre B. Electric heating fabric. 4,538,054, Cl. 219-545.000.
Deak, Gyula; Zara nee Kaczian, Erzsebet; Gyorgy, Lajos; Fekete, Marton; Doda, Margit; Seregi, Andras; Kanyicska, Bela; Toth nee Pecsi, Erzsebet; Horvath nee Gaal, Maria; Manyai, Sandor; Gor-

genyi, Frigyes; and Vaszovics nee Reichmann, Gyorgyi, to EGYT Gyogyszervegyeszeti Gyar. Isoquinoline derivatives. 4,537,895, Cl. 514-307.000.

Deal, Michael A.: *See*—
Blass, Jaroslav; and Deal, Michael A., 4,537,566, Cl. 417-569.000.

Deallenbach, Robert E.: *See*—
Emeterio, Eloy V.; Deallenbach, Robert E.; O'Connor, Martin F.; and Klufas, Oleg, 4,537,560, Cl. 416-198.00A.

Dealto, Michael E.; DiGiacomo, Joseph D.; and Marritt, Clifford R., to Molins, Ltd. Cutting head for filter assembler. 4,537,104, Cl. 83-348.000.

Debono, Manuel: *See*—
Abbott, Bernard J.; Debono, Manuel; and Fukuda, David S., 4,537,717, Cl. 260-112.50R.

DEC International, Inc.: *See*—
Thompson, Paul D., 4,537,152, Cl. 119-14.540.

Decoufle S.A.R.L.: *See*—
Verjux, Jean, 4,537,205, Cl. 131-280.000.

Deere & Company: *See*—
Humke, Albert L., 4,537,028, Cl. 60-272.000.

Defibaugh, William L., to Brown Group Recreational Products, Inc. Foldable swing set. 4,537,392, Cl. 272-85.000.

DeForest, Sherman E., to International Remote Imaging Systems, Inc. Method and apparatus for locating the boundary of an object. 4,538,299, Cl. 382-21.000.

Degen, Helmut: *See*—
Bergmann, Udo; Degen, Helmut; Hansen, Guenter; Krallmann, Reinhold; and Weber, Hans, 4,537,597, Cl. 8-639.000.

Degoix, Bernard; Boussemaer, Daniel; and Allemand, Didier, to Les Cables de Lyon. Reinforced optical fiber butt weld connection. 4,537,468, Cl. 350-96.210.

Degoumois, Michel, to Meseltron S. A. Three-dimensional measuring device. 4,536,961, Cl. 33-169.00R.

Degussa Aktiengesellschaft: *See*—
Hinrichs, Walter; Hammer, Friedrich; and Lange, Ludwig, 4,536,938, Cl. 29-527.500.

Delahoussaye, Ronald D.; and Kelly, Gary W., to Georgia Tech Research Institute. Dynamic brake for manual wheelchair. 4,537,415, Cl. 280-242.0WC.

Delle-Vedove, Daniel; Lallemand, Yves; and Hubert, Olivier, to Societe Europeenne de Propulsion. Process and device for detecting the response of the heart to an electrical stimulation pulse. 4,537,201, Cl. 128-697.000.

De Marsh, Melvin J. Halide and like light reflector and socket assembly. 4,538,215, Cl. 362-282.000.

Demetriades, Peter G. Floor cleaning pad. 4,536,911, Cl. 15-230.120.

De Metz, Frederick C.; and Rackliffe, John R., to Allied Corporation. Construction and method for elongated towed underwater sonar. 4,538,250, Cl. 367-154.000.

DeMeyer, Roy W.; and Kozi, Martin F., to Magnetrol International, Incorporated. Electronic level detector. 4,537,061, Cl. 73-290.00R.

Demizu, Michinosuke: *See*—
Yamanaka, Takashi; Takeya, Yasushi; Yorita, Mitsumasa; Horiuchi, Toshiaki; Inagaki, Kouichi; Naya, Eizo; Demizu, Michinosuke; and Okumura, Mitsuhiro, 4,537,743, Cl. 419-38.000.

Demoute, Jean-Pierre: *See*—
Tessier, Jean; Demoute, Jean-Pierre; and Cadiergue, Joseph, 4,537,897, Cl. 514-351.000.

DeMunck, Johannes W. J.: *See*—
Bussink, Jan; DeMunck, Johannes W. J.; and Marie van Abeelen, Petrus C. A., 4,537,930, Cl. 524-505.000.

Dennis, John R.: *See*—
Ritter, Joachim A.; Bock, Edward C.; Spinelli, Richard A.; and Dennis, John R., 4,537,499, Cl. 355-58.000.

Dennison, Daniel B.: *See*—
Hunter, George L. K.; Dennison, Daniel B.; and Stephens, Charles E., 4,537,637, Cl. 127-60.000.

Denny, William A.: *See*—
Rewcastle, Gordon W.; Atwell, Graham J.; Baguley, Bruce C.; and Denny, William A., 4,537,729, Cl. 260-944.000.

Denpou, Kazuo; Eto, Kazumi; and Niida, Hideo, to Kabushiki Kaisha Toshiba. Refrigerator having temperature-responsive control means for combined direct and fan-cooled operation. 4,537,041, Cl. 62-199.000.

Denton, Gary A.: *See*—
Lubinsky, Anthony R.; Denton, Gary A.; Keller, Paul D.; and Williams, James E., 4,537,494, Cl. 355-3.0DD.

DeSantis, Damian G. Anti-snore pillow. 4,536,905, Cl. 5-434.000.

DeSoto, Inc.: *See*—
Bishop, Timothy E.; Pasternack, George; and Zimmerman, John M., 4,537,667, Cl. 204-159.150.

DeSouza, John: *See*—
Bramwell, Frank; and DeSouza, John, 4,538,019, Cl. 174-6.000.

Dettmers, Michael: *See*—
Weirich, Walter; and Dettmers, Michael, 4,537,221, Cl. 137-637.200.

Detweiler, Steven C. Method and apparatus for line-at-a-time printing. 4,538,162, Cl. 346-155.000.

Deutsch nee Juhasz, Ida: *See*—
Kreidl, Janos; Farkas nee Kirjak, Maria; Harsanyi, Kalman; Benke, Bela ; Rado, Andras; Domany, Gyorgy; Hegedus, Bela; Csongor, Eva; Deutsch nee Juhasz, Ida; and Petho, Hajnalka, 4,537,900, Cl. 514-400.000.

Deutsche Babcock Anlagen Aktiengesellschaft: *See*—
Esser, Anton, 4,537,139, Cl. 110-276.000.

Development of Finance Corporation of New Zealand: *See*—
Rewcastle, Gordon W.; Atwell, Graham J.; Baguley, Bruce C.; and Denny, William A., 4,537,729, Cl. 260-944.000.

De Vera, Dennis, to Eaton Corporation. Switching mechanism and method of making same. 4,536,953, Cl. 29-622.000.

Devuyst, Eric A.: *See*—
Borbely, Gyula J.; Devuyst, Eric A.; Ettel, Victor A.; Mosoiu, Marcel A.; and Schitka, Konstantin J., 4,537,686, Cl. 210-713.000.

Deyer, Craig E., to RCA Corporation. System for inputting a security code to a computer. 4,538,027, Cl. 178-22.010.

Diana, William D., to Exxon Research & Engineering Co. Alcohol recovery process. 4,538,010, Cl. 568-918.000.

Diefenthaler, David L. Tile layer. 4,537,531, Cl. 405-174.000.

Diesel Kiki Co., Ltd.: *See*—
Yamada, Keiichi; and Kimura, Hideyuki, 4,537,170, Cl. 123-449.000.

Dietz, Dennis R., to Technicare Corporation. Annular array ultrasonic transducers. 4,537,074, Cl. 73-625.000.

DiGiacomo, Joseph D.: *See*—
Dealto, Michael E.; DiGiacomo, Joseph D.; and Marritt, Clifford R., 4,537,104, Cl. 83-348.000.

Digicon, Inc.: *See*—
Steetle, David R., 4,538,251, Cl. 367-154.000.

Dimmick, W. Scott; Mitchell, Charles S.; and Moon, William G., to Quantum Corporation. Aerodynamically released safety latch for data transducer assembly in rotating rigid disk data storage device. 4,538,193, Cl. 360-137.000.

Dines, Jack E.: *See*—
Regalbuto, John A.; and Dines, Jack E., 4,537,255, Cl. 166-297.000.

Dinger, Rudolf; Michel, Jean-Georges; and Leuenberger, Claude-Eric, to Asulab S.A. Resonator temperature compensated time base and watch using said time base. 4,537,515, Cl. 368-202.000.

Director-General of Agency of Industrial Science and Technology: *See*—
Kambara, Shu; Arakawa, Tatsumi; and Takahashi, Akio, 4,537,950, Cl. 528-380.000.

Disch, Heinrich: *See*—
Hengstenberg, Eckart; and Disch, Heinrich, 4,537,017, Cl. 53-515.000.

Dischert, Robert A.; and Meise, William H., to RCA Corporation. Adaptive digital signal coring circuit. 4,538,236, Cl. 364-574.000.

Diskowski, Herbert: *See*—
Rottgen, Karl; Stendel, Joachim; and Diskowski, Herbert, 4,537,756, Cl. 423-323.000.

Di Stefano, Frank V., to Air Products and Chemicals, Inc. Crosslinking of chlorine-containing polymers. 4,537,831, Cl. 428-514.000.

Disteldorf, Walter: *See*—
Schneider, Heinz-Walter; Richter, Wolfgang; Disteldorf, Walter; and Kummer, Rudolf, 4,537,987, Cl. 560-193.000.

Ditchek, Brian M.; and Middleton, Thomas R., to GTE Laboratories Incorporated. Mo-Ti members with non-metallic sintering aids. 4,537,323, Cl. 220-2.10R.

Ditter, Walter: *See*—
Reissenweber, Gernot; Kersten, Siegfried; Ditter, Walter; and Jacobs, Peter, 4,537,986, Cl. 560-132.000.

Dixon, George: *See*—
Culbertson, Samuel W.; and Dixon, George, 4,537,357, Cl. 239-290.000.

Dr.-Ing. Rudolf Hell GmbH: *See*—
Schoppmeyer, Johannes, 4,537,470, Cl. 350-317.000.

Doda, Margit: *See*—
Deak, Gyula; Zara nee Kaczian, Erzsebet; Gyorgy, Lajos; Fekete, Marton; Doda, Margit; Seregi, Andras; Kanyicska, Bela; Toth nee Pecsi, Erzsebet; Horvath nee Gaal, Maria; Manyai, Sandor; Gorgenyi, Frigyes; and Vaszovics nee Reichmann, Gyorgyi, 4,537,895, Cl. 514-307.000.

Dodd, Timothy J.: *See*—
Crain, Stephen F.; Gray, Steven H.; Arnold, Edward P.; and Dodd, Timothy J., 4,538,221, Cl. 364-172.000.

Doi, Ryota: *See*—
Tsukui, Tsutomu; Shimizu, Toshio; Doi, Ryota; and Tsutsumi, Yasuyuki, 4,537,840, Cl. 429-33.000.

Domany, Gyorgy: *See*—
Kreidl, Janos; Farkas nee Kirjak, Maria; Harsanyi, Kalman; Benke, Bela ; Rado, Andras; Domany, Gyorgy; Hegedus, Bela; Csongor, Eva; Deutsch nee Juhasz, Ida; and Petho, Hajnalka, 4,537,900, Cl. 514-400.000.

Domnick Hunter Filters Ltd.: *See*—
Billiet, Colin T., 4,537,748, Cl. 422-122.000.

Donaldson, William R.; and Tang, Chung L., to Cornell Research Foundation, Inc. Method for growing single crystals of urea. 4,537,990, Cl. 564-63.000.

Donike, Wilhelm; Ulrich, Helmut; Thiemer, Heinz; and Pieper, Josefa, to Chemische Werke Huls AG. Process for producing Diels-Alder adducts while inhibiting the formation of polymeric by-products. 4,538,013, Cl. 585-361.000.

Donohue, John J.: *See*—
Gaffar, Abdul; Davis, Calvin B.; Donohue, John J.; and Moy, Debbie, 4,537,765, Cl. 424-53.000.

Dorey, John K., II; Schmidt, Steven L.; and Townsend, Wesley P., to AT&T Technologies, Inc. Selective metallization process. 4,537,799, Cl. 427-259.000.

Doria, Gianfederico; Passarotti, Carlo; and Buttinoni, Ada, to Farmitalia Carlo Erba, S.p.A. Substituted 1,3,4-thiadiazolo[3,2-A]pyrimidines and compositions containing them. 4,537,962, Cl. 544-255.000.

Dorner, Leonhard: *See—*
Schreder, Felix; Dorner, Leonhard; and Wilde, Eugen, 4,538,051, Cl. 219-466.000.

Douglas, Brian, to Subscan Systems Ltd. Pipeline vehicle. 4,537,136, Cl. 104-138.00G.

Douglas, Bruce S.; and Westergart, Chester V., to Test Point 1, Inc. In-circuit test apparatus for printed circuit board. 4,538,104, Cl. 324-158.00F.

Douklias, Nikolaos; and Grabmaier, Josef, to Siemens Aktiengesellschaft. Method for manufacturing glass from the gas phase. 4,537,611, Cl. 65-18.200.

Douty, George H.; Landis, John M.; and Snyder, Clair W., Jr., to AMP Incorporated. Intercard-extraction means. 4,537,454, Cl. 339-45.00M.

Dow Chemical Company, The: *See—*
Bruschtein, Fabio B.; Jahn, Robert G.; and Wittbrodt, Edwin L., 4,537,916, Cl. 523-201.000.
Chonde, Yohannes, 4,537,911, Cl. 521-28.000.
Purinton, Robert J., Jr., 4,537,700, Cl. 252-315.100.
Strange, Carl P.; Martin, Harold B., Jr.; and Tsang, Albert C., 4,537,958, Cl. 536-85.000.
Wilson, Daniel C., 4,537,351, Cl. 239-43.000.

Dow Corning Corporation: *See—*
Blizzard, John D.; and Swihart, Terence J., 4,537,829, Cl. 428-429.000.
Keil, Joseph W., 4,537,677, Cl. 208-370.000.

Downey, Gale D.; and Jones, Charles E., to FMC Corporation. Homogeneous laundry detergent slurries containing nonionic surface-active agents. 4,537,708, Cl. 252-554.000.

Doyel, John S. Portable, hand-held steaming or pressing device. 4,536,977, Cl. 38-77.830.

Doyle, Walter M., to Laser Precision Corporation. Interferometer spectrometer having improved scanning reference point. 4,537,508, Cl. 356-346.000.

Drabing, Richard B., to Amtel Systems Corporation. Power line communication system utilizing a local oscillator. 4,538,136, Cl. 340-310.00R.

Drago, Russell S.; Miller, James G.; and Weiss, Keith D., to University of Florida. Method for the preparation of halogen substituted methanes and ethanes. 4,538,011, Cl. 570-240.000.

Dresser Industries, Inc.: *See—*
Bulat, Bulent, 4,538,063, Cl. 250-214.00R.

Dubon, Chantal; Hok, Bertil; and Ovren, Christer, to ASEA Aktiebolag. Hermetic sealing of gallium arsenide components. 4,537,467, Cl. 350-96.200.

Dulux Australia Ltd.: *See—*
Parr, Rodney W., 4,538,000, Cl. 568-616.000.

Dunlop Limited: *See—*
Yardley, James F., 4,537,825, Cl. 428-327.000.

Duo-Matic/Olsen Inc.: *See—*
Hwang, Kyu S.; and Koestler, Dennis J., 4,537,178, Cl. 126-110.00R.

Du Pont de Nemours, E. I.. and Company: *See—*
Farago, John, 4,537,733, Cl. 264-9.000.
Hormadaly, Jacob, 4,537,703, Cl. 252-518.000.
Rao, Velliyur N. M.; and Heinsohn, George E., 4,537,726, Cl. 260-453.00P.
Shenvi, Ashokkumar B., 4,537,773, Cl. 514-63.000.
Shenvi, Ashokkumar B., 4,537,963, Cl. 546-66.000.
Tam, Wilson, 4,538,003, Cl. 568-656.000.

Duprez, Wayne R., to Standard-Thomson Corporation. Fail-safe oil flow control apparatus. 4,537,346, Cl. 236-34.500.

Dupro AG: *See—*
Maier, Siegfried; and Albrecht, Eckart, 4,537,424, Cl. 285-7.000.

Durable Packaging Corporation: *See—*
Ulrich, Lawrence W.; and Walker, Connie W., 4,537,649, Cl. 156-355.000.

Duracell Inc.: *See—*
Wiacek, Marian; Markin, Charles; and Book, Ronald J., 4,537,841, Cl. 429-56.000.

Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., to Smith Kline & French Laboratories Limited. Pharmacologically active compounds. 4,537,779, Cl. 514-275.000.

Durisin, Bretislav, to Eaton Corporation. Engine component position indicating system. 4,537,168, Cl. 123-198.00R.

Durkee, David B.; and Liebman, Alan J., to AT&T Teletype Corporation. Ink jet printer. 4,538,156, Cl. 346-21.000.

Dwyer Instruments, Inc.: *See—*
Wrobel, Stanley A.; and Ashton, Robert G., 4,537,068, Cl. 73-202.000.

Dykman, Edmund: *See—*
Pikarski, Michael; Gabe, Julian; and Dykman, Edmund, 4,537,992, Cl. 564-437.000.

Dynamit Nobel AG: *See—*
Seiler, Claus-Dietrich; and Vahlensieck, Hans-Joachim, 4,537,983, Cl. 556-479.000.

E.G.O. Elektro-Gerate Blanc U. Fischer: *See—*
Schreder, Felix; Dorner, Leonhard; and Wilde, Eugen, 4,538,051, Cl. 219-466.000.

E. R. Squibb & Sons, Inc.: *See—*
O'Sullivan, Joseph; Aklonis, Carol A.; and Singh, Pushpa, 4,537,858, Cl. 435-119.000.
Snitman, David L.; Haslanger, Martin F.; and Sprague, Peter W., 4,537,904, Cl. 514-469.000.
Snitman, David L.; Haslanger, Martin F.; and Sprague, Peter W., 4,537,981, Cl. 549-463.000.

E-Systems, Inc.: *See—*
Mosley, William H., Jr.; and Andren, Carl F., 4,538,280, Cl. 375-1.000.

Eagle-Picher Industries, Inc.: *See—*
Walker, Joe M.; and Potts, Thomas M., 4,537,759, Cl. 423-349.000.

Eastman Kodak Company: *See—*
Gupta, Mool C.; Wrobel, Joseph J.; and Howe, Dennis G., 4,538,159, Cl. 346-135.100.
Russel, Matthew J., 4,537,493, Cl. 355-3.0SH.
Stoudt, Michael D., 4,537,490, Cl. 355-3.00R.

Eaton Corporation: *See—*
Bielinski, Ralph F.; Chacon, M. Frank; Kramer, Dennis M.; Mathias, William R.; and Schneider, Stanley 4,538,199, Cl. 361-93.000.
De Vera, Dennis, 4,536,953, Cl. 29-622.000.
Durisin, Bretislav, 4,537,168, Cl. 123-198.00R.
Jones, Michael E., 4,537,090, Cl. 74-502.000.
Speranza, Donald, 4,537,353, Cl. 239-102.000.

Eckert, Heiner. Process for the reduction of reducible groups and its use. 4,537,713, Cl. 260-112.50R.

Economics Laboratory, Inc.: *See—*
Mahoney, Dennis F.; and Block, William V., 4,537,705, Cl. 252-529.000.

Ed. Scharwachter GmbH & Co. KG: *See—*
Brockhaus, Ernst, 4,536,918, Cl. 16-308.000.

Edenfeld, Arthur R.: *See—*
Bracco, Al M.; Edenfeld, Arthur R.; and Kotecha, Harish N., 4,536,944, Cl. 29-571.000.

Edge, David J.; Naik, Appaya R.; and Scott, Melvin, to Lever Brothers Company. Liquid detergent composition comprising selected alkylbenzene sulphonates and alkyl ether sulphates. 4,537,709, Cl. 252-558.000.

Edler, Friedrich, to Chemie und Filter GmbH Verfahrenstechnik KG. Electromagnetically operated diaphragm pump. 4,537,565, Cl. 417-413.000.

Edwards, Ivan L.; and Macrander, Max S., to GTE Automatic Electric Incorporated. Prioritized clock selection circuit. 4,538,272, Cl. 371-61.000.

Efron, Uzi: *See—*
Little, Michael J.; Brown, Roger H.; Efron, Uzi; and Hoberg, Clarence P., 4,537,827, Cl. 428-409.000.

Egan, Joseph P., Jr.: *See—*
Kilner, Peter H.; Egan, Joseph P., Jr.; Ceisel, Stephen G.; and Schammel, Wayne P., 4,537,978, Cl. 549-245.000.

Egawa, Takeshi: *See—*
Taniguchi, Nobuyuki; Ishikawa, Norio; and Egawa, Takeshi, 4,537,487, Cl. 354-400.000.

Eggert, Walter: *See—*
Becher, Friedrich; and Eggert, Walter, 4,537,537, Cl. 409-34.000.

EGYT Gyogyszervegyeszeti Gyar: *See—*
Deak, Gyula; Zara nee Kaczian, Erzsebet; Gyorgy, Lajos; Fekete, Marton; Doda, Margit; Seregi, Andras; Kanyicska, Bela; Toth nee Pecsi, Erzsebet; Horvath nee Gaal, Maria; Manyai, Sandor; Gorgenyi, Frigyes; and Vaszovics nee Reichmann, Gyorgyi, 4,537,895, Cl. 514-307.000.

Ehlscheid, Gunter; and Frost, Heinz-Helmut, to Winkler & Dunnerbier Maschinenfabrik und Eisengiesserei GmbH & Co. KG. Punch device for making window cut-outs. 4,537,588, Cl. 493-342.000.

Eicken, Karl: *See—*
Plath, Peter; Eicken, Karl; Sauter, Hubert; and Wuerzer, Bruno, 4,537,617, Cl. 71-92.000.

Eike, Einar, to Golar Metall, Hilco Industries A/S. Ship/offshore window for permanent mounting in the external steel bulkhead of a wall. 4,536,999, Cl. 52-208.000.

Eith, Gerhard, to Siemens Aktiengesellschaft. Orifice valve for an ultrasonic liquid atomizer. 4,537,354, Cl. 239-102.000.

Elbers, Richard W., to Cambridge Filter Corporation. Corrugated spacers for pleated air filter media. 4,537,812, Cl. 428-182.000.

Electronic Concepts, Inc.: *See—*
Lavene, Bernard, 4,538,205, Cl. 361-308.000.

Electronique Serge Dassault: *See—*
Gaucher, Michel M. G., 4,537,125, Cl. 101-93.040.

Eli Lilly and Company: *See—*
Abbott, Bernard J.; Debono, Manuel; and Fukuda, David S., 4,537,717, Cl. 260-112.50R.
Anderson, Marie T.; Michel, Karl H.; and Sands, Thomas H., 4,537,777, Cl. 514-521.000.
Baltz, Richard H.; Wild, Gene M.; and Seno, Eugene T., 4,537,957, Cl. 336-7.100.
Barton, Russell L.; Briggs, Stephen L.; and Koppel, Gary A., 4,537,727, Cl. 260-455.00R.
Bjerregaard, Richard S., 4,537,333, Cl. 222-345.000.
Boeck, LaVerne D.; Clem, Gladys M.; Hershberger, Charles L.; Anderson, Marie T.; and Michel, Karl H., 4,537,715, Cl. 260-112.50R.
Chou, Ta-Sen, 4,537,959, Cl. 544-025.000.
Gallick-Whitaker, Nancy G., 4,537,965, Cl. 546-82.000.
Hall, David A., 4,537,720, Cl. 260-239.00A.
Hamill, Robert L.; and Kastner, Ralph E., 4,537,879, Cl. 514-9.000.
Michel, Karl H.; and Kastner, Ralph E., 4,537,770, Cl. 424-118.000.
Schaus, John M., 4,537,964, Cl. 544-250.000.
Spitzer, Wayne A., 4,537,889, Cl. 514-243.000.
Titus, Robert D.; and Kornfeld, Edmund C., 4,537,893, Cl. 514-293.000.

Elings, Virgil B.; and Nicoli, David F. Apparatus and method for homogeneous immunoassay. 4,537,861, Cl. 436-518.000.
Elkem a/s: *See*—
Krogsrud, Harald, 4,537,551, Cl. 414-199.000.
Ellingson, Robert T., to Reese Enterprises, Inc. Glazing bead structure. 4,537,002, Cl. 52-403.000.
Ellington, Thomas S., IV: *See*—
Banks, Edward L.; Ellington, Thomas S., IV; and Zavecz, Terrence E., 4,537,498, Cl. 355-55.000.
Ellis, John R. B.: *See*—
Platt, James L., Jr.; and Ellis, John R. B., 4,536,973, Cl. 34-182.000.
Ellis Margaret D.; Ferencz, Richard L.; and Kalz, Dietmar, to Mobay Chemical Corporation. Process for the direct acetylation of aromatic amines. 4,537,991, Cl. 564-133.000.
Elmore, Walter A., to Westinghouse Electric Corp. Three terminal current differential protective relay. 4,538,195, Cl. 361-64.000.
Elscint Ltd.: *See*—
Kamil, Zvi, 4,537,033, Cl. 62-3.000.
Elson, Thomas D.; and Millhone, Ralph S., to Chevron Research Company. Steam injection well gravel pack material of sintered bauxite. 4,537,254, Cl. 166-278.000.
Emerson Electric Co.: *See*—
LaRou, Albert M.; and Atteberry, Eldon A., 4,537,519, Cl. 384-478.000.
Emeterio, Eloy V.; Deallenbach, Robert E.; O'Connor, Martin F.; and Klufas, Oleg, to General Electric Company. Radial key for steam turbine wheels. 4,537,560, Cl. 416-198.00A.
Emhart Industries, Inc.: *See*—
Amonett, Daniel K., 4,538,037, Cl. 200-38.00R.
Coe, Jerry R.; Pearce, Godfrey R.; and See, Francis R., 4,538,025, Cl. 174-52.00S.
Shedigian, Vandos, 4,538,206, Cl. 361-315.000.
Shedigian, Vandos, 4,538,207, Cl. 361-317.000.
Shedigian, Vandos, 4,538,208, Cl. 361-319.000.
Emmerling, Hans-Jorg; and Hamm, Josef, to Robert Bosch GmbH. Packaging machine. 4,537,014, Cl. 53-570.000.
Emmett, John C.: *See*—
Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,537,779, Cl. 514-275.000.
Endres, Douglas W.; McDaniel, Kenneth D., Jr.; and Griebel, Francis J., to FMC Corporation. Two person aerial platform. 4,537,281, Cl. 182-2.000.
Energy Conversion Devices, Inc.: *See*—
Ovshinsky, Stanford R.; Sapru, Krishna; and Liang, Gao, 4,537,674, Cl. 204-290.00R.
Strand, David A., 4,537,670, Cl. 204-224.00R.
Energy Sciences, Inc.: *See*—
Nablo, Sam V., 4,537,811, Cl. 428-166.000.
Engel, Isaac, to State of Israel, Ministry of Defence, Military Industries, The. Rear-sight for a weapon. 4,536,966, Cl. 33-257.000.
England, Thomas R., to Kollmorgen Technologies, Corporation. Flux contoured rotary electromagnetic machine. 4,538,080, Cl. 310-154.000.
Enomoto, Ryo; and Tsukada, Kiyotaka, to Ibiden Kabushiki Kaisha. Method of producing a silicon carbide sintered compact. 4,537,735, Cl. 264-63.000.
Entac Company, Limited: *See*—
Nozawa, Yoshikuni, 4,538,083, Cl. 310-198.000.
Environmental Research & Technology: *See*—
Wong-Chong, George M., 4,537,682, Cl. 210-611.000.
EPR Corporation: *See*—
Charney, Joseph C.; Goodman, Phillip M.; and Morgan, Robert H., 4,537,522, Cl. 401-218.000.
Eprova Ag Forschungsinstitut: *See*—
Muller, Hans-Rudolf; and Bollinger, Heinrich, 4,537,714, Cl. 260-112.50R.
Epstein, Saul. Electronic thermometer. 4,537,516, Cl. 374-1.000.
Erickson, Edward C., to Sales Tools, Inc. Needlework pattern booklet holder. 4,537,380, Cl. 248-460.000.
Ericsson, Thomas, to Papyrus Kopparfors AB. Particulate oil-absorbing composition to absorb oil. 4,537,877, Cl. 502-402.000.
Ernst, Werner, to Kohlensaure-Werke Rudolf Buse Sohn GmbH & Co. Method and apparatus for investigating the structure and porosity of earth and stony regions. 4,537,062, Cl. 73-38.000.
Esaki, Leo: *See*—
Chang, Chin-An; Chang, Leroy L.; Esaki, Leo; and Mendez, Emilio E., 4,538,165, Cl. 357-22.000.
Eschmann, Heinz: *See*—
Tetenborg, Konrad; and Eschmann, Heinz, 4,537,013, Cl. 53-570.000.
ESE Limited: *See*—
Lang, Gordon R.; Forney, George D., Jr.; Qureshi, Shahid; Longstaff, Fred M.; and Lee, Chi H., 4,538,284, Cl. 375-39.000.
Esge-Marby GmbH & Co. KG: *See*—
Belka, Heinrich, 4,537,338, Cl. 224-39.000.
Eskelinen, Pekka, to Valmet Oy. Procedure for boosting the ventilation in the hood of a paper machine. 4,536,970, Cl. 34-41.000.
ESPE Fabrik pharmazeutischer Praeparate GmbH: *See*—
Herold, Wolf-Dietrich; Grafwallner, Karl L.; and Keller, Michael, 4,538,070, Cl. 250-504.00R.
Esselborn, Reiner: *See*—
Bernhard, Horst; and Esselborn, Reiner, 4,537,636, Cl. 106-291.000.
Esser, Anton, to Deutsche Babcock Anlagen Aktiengesellschaft. Grate of incinerator. 4,537,139, Cl. 110-276.000.
Estebanez, Joseph: *See*—
Rogers, Colin C.; Baker, John N.; and Estebanez, Joseph, 4,537,212, Cl. 137-2.000.
Estes, Roy D.; and Wright, Beaumont B., to Rock Bit Industries U.S.A., Inc. Radial rock bit seal. 4,537,409, Cl. 277-83.000.
Etablissements Proteor: *See*—
Palfray, Michel R., 4,536,898, Cl. 623-33.000.
Ethyl Corporation: *See*—
Li, Hsueh M., 4,537,755, Cl. 423-300.000.
McKinnie, Bonnie G.; and Robinson, Gene C., 4,537,724, Cl. 260-400.000.
Roper, Jerry M., 4,537,920, Cl. 252-52.00R.
Stahly, G. Patrick, 4,538,004, Cl. 568-707.000.
Stahly, G. Patrick, 4,538,005, Cl. 568-707.000.
Stahly, G. Patrick, 4,538,006, Cl. 568-707.000.
Eto, Kazumi: *See*—
Denpou, Kazuo; Eto, Kazumi; and Niida, Hideo, 4,537,041, Cl. 62-199.000.
Ettel, Victor A.: *See*—
Borbely, Gyula J.; Devuyst, Eric A.; Ettel, Victor A.; Mosoiu, Marcel A.; and Schitka, Konstantin J., 4,537,686, Cl. 210-713.000.
Etudes et Fabrication Dowell Schlumberger: *See*—
Parcevaux, Philippe A.; Piot, Bernard M.; and Vercaemer, Claude J., 4,537,918, Cl. 523-130.000.
Eudier, Michel; Huret, Noel; and Meunier, Jean, to Cegedur Societe de Transformation de L'Aluminim Pechiney; and Alliages Frittes METAFRAM. Engine cylinder liners based on aluminum alloys and intermetallic compounds, and methods of obtaining them. 4,537,167, Cl. 123-193.00C.
Evans, Anthony C., to Kelsey-Hayes Company. Sliding caliper disc brake. 4,537,290, Cl. 188-73.310.
Everman, Wayne F.; Lewis, D. Michael; and Russell, Raymond L., to Container Corporation of America. Method and apparatus for forming plastic liners and inserting them into bulk containers. 4,537,584, Cl. 493-93.000.
Eversole, Frank A. Lug nut remover. 4,537,101, Cl. 81-180.100.
Ewing, Robert L.; Hughes, James S.; and Bruggeman, Bruce, to Manville Service Corporation. Floodlight luminaire. 4,538,217, Cl. 362-375.000.
Ex-Cell-O Corporation: *See*—
O'Rourke, Glenn R., 4,537,422, Cl. 280-705.000.
Rangwala, Badruddin K.; and Flack, Toney S., 4,537,335, Cl. 222-496.000.
Wise, Daniel J.; and Woodhall, Donna M., 4,537,815, Cl. 428-219.000.
Exanno Products Limited: *See*—
Sullivan, Michael T., 4,537,430, Cl. 285-364.000.
Excelermatic Inc.: *See*—
Kraus, Charles E., 4,537,093, Cl. 74-798.000.
Exxon Production Research Co.: *See*—
Davis, Albert P., Jr.; and Robinson, Leon H., 4,537,457, Cl. 339-117.00P.
Exxon Research and Engineering Co.: *See*—
Agarwal, Pawan K.; and Lundberg, Robert D., 4,537,919, Cl. 523-336.000.
Bearden, Roby; and Stuntz, Gordon F., 4,537,676, Cl. 208-251.00R.
Cooke, Theodore M.; Lin, Robert A.; Whitfield, Richard G.; and Hock, Allan G., 4,537,631, Cl. 106-22.000.
Diana, William D., 4,538,010, Cl. 568-918.000.
Fiato, Rocco A.; Soled, Stuart L.; and Montagna, Angelo A., 4,537,867, Cl. 502-74.000.
Peiffer, Dennis G.; Lundberg, Robert D.; and Pober, Kenneth W., 4,537,688, Cl. 252-8.50M.
Rossi, Albert; and Lewtas, Kenneth, 4,537,702, Cl. 44-62.000.
F & H Holdings, Inc.: *See*—
Holcomb, David A., 4,537,123, Cl. 100-125.000.
F & M Trading Company: *See*—
Griffin, Michael E., 4,537,315, Cl. 211-70.600.
Fabian, Klaus: *See*—
Hermann, Hans D.; and Fabian, Klaus, 4,537,830, Cl. 428-437.000.
Fabriques de Tabac Reunies S.A.: *See*—
Gaisch, Helmut; Ghiste, Patrick D. L.; and Schulthess, Dieter, 4,537,204, Cl. 131-274.000.
Facchini, Libero, to Farmatic S.r.l. Apparatus for selecting and supplying capsules or like round articles of deformable material to the feed hopper of machines for handling these articles. 4,537,300, Cl. 198-453.000.
Fadler, Kurt; and Kittel, Friedrich, to Fichtel & Sachs AG. Clutch disc assembly with torsional oscillation dampers. 4,537,295, Cl. 192-106.200.
Fadner, Thomas A.; and Hycner, Stanley H., to Rockwell International Corporation. Black oxide lithographic ink metering roller. 4,537,127, Cl. 101-141.000.
Fairchild Research Center: *See*—
Venkateswaran, Kalyanasundaram, 4,538,247, Cl. 365-230.000.
Faitel, William M., to Lamb Technicon Corp. Rotary chain drive mechanism with periodic output dwell. 4,537,087, Cl. 74-394.000.
Falchle, Jorg: *See*—
Schmid, Wolfgang; Wanner, Karl; Falchle, Jorg; Bleicher, Manfred; and Muller, Frank, 4,537,264, Cl. 173-48.000.
Fanuc Ltd.: *See*—
Kawada, Shigeki; Amemiya, Yoichi; Sogabe, Masatoyo; and Iwamatsu, Noboru, 4,538,084, Cl. 310-217.000.
Matsui, Mitsuo; and Matsumura, Teruyuki, 4,538,098, Cl. 318-567.000.

Farago, John, to Du Pont de Nemours, E. I., and Company. Nonwoven fiber-sheet process. 4,537,733, Cl. 264-9.000.
Farina, John. Golf club. 4,537,403, Cl. 273-164.000.
Farkas nee Kirjak, Maria: *See*—
Kreidl, Janos; Farkas nee Kirjak, Maria; Harsanyi, Kalman; Benke, Bela ; Rado, Andras; Domany, Gyorgy; Hegedus, Bela; Csongor, Eva; Deutsch nee Juhasz, Ida; and Petho, Hajnalka, 4,537,900, Cl. 514-400.000.
Farmatic S.r.l.: *See*—
Facchini, Libero, 4,537,300, Cl. 198-453.000.
Farmitalia Carlo Erba, S.p.A.: *See*—
Doria, Gianfederico; Passarotti, Carlo; and Buttinoni, Ada, 4,537,962, Cl. 544-255.000.
Fast, Jacob. Merchandise information display tag with guide means. 4,537,821, Cl. 428-121.000.
Favier, Andre-Marcel: *See*—
Boiron, Jean; Boiron, Christian; Abecassis, Jacky; and Favier, Andre-Marcel, 4,537,512, Cl. 366-132.000.
Fearon, Robert E. Vapor compression distilling and salt concentrating device. 4,537,039, Cl. 62-182.000.
Feder, Joseph: *See*—
Tolbert, William R.; Feder, Joseph; and Lewis, Charles, Jr., 4,537,860, Cl. 435-240.000.
Fekete, Marton: *See*—
Deak, Gyula; Zara nee Kaczian, Erzsebet; Gyorgy, Lajos; Fekete, Marton; Doda, Margit; Seregi, Andras; Kanyicska, Bela; Toth nee Pecsi, Erzsebet; Horvath nee Gaal, Maria; Manyai, Sandor; Gorgenyi, Frigyes; and Vaszovics nee Reichmann, Gyorgyi, 4,537,895, Cl. 514-307.000.
Feldman, Richard B., to Chevron Research Company. Water detection subassembly and method of forming same, for computer processing centers. 4,538,141, Cl. 340-604.000.
Ferag AG: *See*—
Reist, Walter, 4,538,161, Cl. 346-140.00R.
Ferencz, Richard L.: *See*—
Ellis Margaret D.; Ferencz, Richard L.; and Kalz, Dietmar, 4,537,991, Cl. 564-133.000.
Ferguson, Donald K., to Canadian General Electric Company Limited. Current transformer secondary voltage limiter. 4,538,202, Cl. 361-124.000.
Ferranti, plc: *See*—
Morison, John M., 4,538,177, Cl. 358-101.000.
Ferry, Michel F.: *See*—
Ballatore, Daniel; Bonnet, Yves A.; Ferry, Michel F.; and Jacquart, Christian A., 4,538,032, Cl. 179-170.00D.
Feyen, Peter; Seifert, Hermann; and Kohler, Egon, to Bayer Aktiengesellschaft. Preparation of O,S-dimethyl-thiolophosphoric acid amide. 4,537,730, Cl. 260-989.000.
Feyerl, Gunther; Minichshofer, Klaus; and Pum, Hans G., to Textilmaschinenfabrik Dr. Ernst Fehrer Aktiengesellschaft. Apparatus for manufacturing endless needled paper machine felts. 4,536,927, Cl. 28-110.000.
Fiato, Rocco A.; Soled, Stuart L.; and Montagna, Angelo A., to Exxon Research and Engineering Co. Promoted iron-cobalt spinel catalyst for Fischer-Tropsch processes. 4,537,867, Cl. 502-74.000.
Fichtel & Sachs AG: *See*—
Fadler, Kurt; and Kittel, Friedrich, 4,537,295, Cl. 192-106.200.
Field Effects, Inc.: *See*—
Gluckstern, Robert L.; Holsinger, Ronald F.; and Lown, Robert R., 4,538,130, Cl. 335-306.000.
Figgie International Inc.: *See*—
Vicenzi, Reno L., 4,537,189, Cl. 128-202.130.
Young, Jorge A.; and Khandwala, Bhupendra J., 4,538,056, Cl. 235-377.000.
Fikentscher, Rolf: *See*—
Oppenlaender, Knut; Fikentscher, Rolf; Buettner, Egon; Slotman, Wilhelmus; Schwartz, Erich; and Mohr, Rudolf, 4,537,701, Cl. 252-344.000.
Firestone Tire & Rubber Company, The: *See*—
Hall, James E.; and Schulz, Donald N., 4,537,939, Cl. 526-179.000.
Hergenrother, William L., 4,537,917, Cl. 523-209.000.
Firey, Joseph C. Cyclic char gasifier devolatilization process. 4,537,603, Cl. 48-197.00R.
Firth, Bruce E.; and Rosen, Terry J., to UOP Inc. Preparation of ortho-alkylated phenols. 4,538,008, Cl. 568-783.000.
Fischer, Walter; and Zweifel, Hans, to Ciba-Geigy Corporation. Tetrasubstituted phthalic acid derivatives, and a process for their preparation. 4,537,977, Cl. 549-243.000.
Fisher, Kenneth J.; and Miller, William R., to American Sterilizer Company. Magnetically supported surgical light. 4,538,214, Cl. 362-147.000.
Fisher, Richard T. Magnetic flux-shifting actuator. 4,538,129, Cl. 335-230.000.
Fisher, William M. Vehicle with pneumatic assembly for driving, braking, and reducing friction on bearings. 4,537,269, Cl. 180-10.000.
Fitzpatrick, Brian J., to North American Philips Corporation. Green luminescent cathode-ray tube device with improved color filtering system. 4,538,089, Cl. 313-478.000.
Fitzpatrick, William B., to Storage Technology Corporation. (1,8) Data encoder/decoder. 4,538,189, Cl. 360-40.000.
FitzSimons, Louis N. Earth retaining end element for use with overfilled load support structures. 4,537,529, Cl. 405-125.000.
Fix, Joseph A.: *See*—
Alexander, Jose; and Fix, Joseph A., 4,537,772, Cl. 514-9.000.
Flack, Toney S.: *See*—
Rangwala, Badruddin K.; and Flack, Toney S., 4,537,335, Cl. 222-496.000.
Flakt Aktiebolag: *See*—
Josefsson, Leif, 4,537,120, Cl. 98-115.200.
Flanagan, John J. Floor finishing, cleaning and burnishing compositions containing ucon polymers, and method of use. 4,537,802, Cl. 427-368.000.
Flanner, Philip D.; Morris, Harold D.; and Newell, Gerald R., to Systron Donner Corp. Passive mass-spring type of sensing device having electronic damping. 4,538,203, Cl. 361-159.000.
Flautt, Martin C.: *See*—
Armstrong, Gordon P.; Flautt, Martin C.; and Williams, Gary L., 4,537,107, Cl. 83-694.000.
Armstrong, Gordon P.; and Flautt, Martin C., 4,537,610, Cl. 65-3.440.
Fleet, Charles R. W.; and Hewinson, Vincent K., to Fogarty P.L.C. Processed feathers. 4,537,594, Cl. 8-94.10R.
Fleetwood Systems, Inc.: *See*—
Mojden, Wallace W.; and Darr, Robert E., 4,537,010, Cl. 53-447.000.
Mojden, Wallace W.; and Darr, Robert E., 4,537,550, Cl. 414-46.000.
Fleming, Ward. Pin screen. 4,536,980, Cl. 40-427.000.
Flesher, Peter; and Langley, John G., to Allied Colloids Limited. Process for dissolving polymeric material. 4,537,513, Cl. 366-162.000.
Flodin, Claes-Goran. Arrangement for a cutting device. 4,537,103, Cl. 83-174.000.
Floss, Josef G.: *See*—
Schmidt, Franz; Pipper, Gunter; Floss, Josef G.; and Zahradnik, Franz, 4,537,949, Cl. 528-335.000.
Flowers, Michael A.: *See*—
Barnett, Steve M.; Flowers, Michael A.; and Varos, John A., 4,536,890, Cl. 2-164.000.
Floyd, William C., to Sun Chemical Corporation. Compounds and their use as insolubilizers for binders for paper coating compositions. 4,537,634, Cl. 106-214.000.
FMC Corporation: *See*—
Downey, Gale D.; and Jones, Charles E., 4,537,708, Cl. 252-554.000.
Endres, Douglas W.; McDaniel, Kenneth D., Jr.; and Griebel, Francis J., 4,537,281, Cl. 182-2.000.
Jensen, Lyle B., 4,537,317, Cl. 212-189.000.
Kreamer, William C., 4,537,009, Cl. 53-441.000.
Foa , Marco; Francalanci, Franco; Gardano, Andrea; and Bencini, Elena, to Montedison S.p.A. Process for the preparation of esters or salts of aromatic or etheroaromatic acids. 4,537,970, Cl. 546-319.000.
Fock, Jurgen; and Schedlitzki, Dietmar, to Th. Goldschmidt AG. Thermosetting adhesive. 4,537,934, Cl. 525-123.000.
Fogarty P L.C.: *See*—
Fleet, Charles R. W.; and Hewinson, Vincent K., 4,537,594, Cl. 8-94.10R.
Fogarty, Terence M., to Mentor Corporation. Connector device for connecting elastic tubing of an implantable device. 4,537,183, Cl. 128-79.000.
Fogel, Arnold W.; and Zofchak, Albert, to Bernel Chemical Co.; and Alzo, Inc. Hair compositions containing mixtures of quaternary ammonium compounds and tertiary amine salts of long-chain acids. 4,537,762, Cl. 424-70.000.
Fohlen, George M.: *See*—
Achar, Bappalige N.; Fohlen, George M.; and Parker, John A., 4,537,834, Cl. 428-413.000.
Fohler, Johann, to Voest-Alpine Aktiengesellschaft. Arrangement for exchanging measuring and/or sampling probes. 4,537,072, Cl. 73-432.00R.
Fontaine, Joseph S.: *See*—
Kennedy, Alvin B., III; Fontaine, Joseph S.; Kennard, Alfred J.; and Morrison, J. Bruce, 4,537,685, Cl. 210-709.000.
Ford Aerospace & Communications Corporation: *See*—
Chan, Fred N., 4,537,375, Cl. 244-171.000.
Pizzurro, Vito F., 4,537,370, Cl. 244-3.160.
Ford Motor Company: *See*—
Anderson, Robert L., 4,538,106, Cl. 324-158.00T.
Haesters, Hermann, 4,537,115, Cl. 98-2.180.
Forizs, Lorant. VTOL Aircraft. 4,537,372, Cl. 244-12.400.
Forney, George D., Jr.: *See*—
Lang, Gordon R.; Forney, George D., Jr.; Qureshi, Shahid; Longstaff, Fred M.; and Lee, Chi H., 4,538,284, Cl. 375-39.000.
Fory, Werner: *See*—
Meyer, Willy; and Fory, Werner, 4,537,619, Cl. 71-93.000.
Schurter, Rolf; Fory, Werner; and Meyer, Willy, 4,537,618, Cl. 71-92.000.
Fossett, Lawrence D.; and Michael, Steven C., to AT&T Information Systems Inc. Method and apparatus for establishing telephone calling costs. 4,538,030, Cl. 179-7.1TP.
Foster, Billy R. Unitary endotracheal tube holder. 4,537,192, Cl. 128-207.170.
Foster, Clark B., to Boeing Company, The. Method for applying turbulators to wind tunnel models. 4,537,647, Cl. 156-245.000.
Fouchard, Serge: *See*—
Ugon, Michel; and Fouchard, Serge, 4,538,058, Cl. 235-380.000.
Fountain, Michael W.: *See*—
Varndell, Sydney A.; Lawson, Douglas R.; and Fountain, Michael W., 4,536,906, Cl. 3-468.000.

Fourche , Jean-Pierre; and Milili, Marc, to Videocolor. Deviator for an auto convergent color picture tube and its method of manufacture. 4,538,128, Cl. 335-210.000.
Fowler, Randall C.; Ruby, Kenneth; and Sartor, Thomas F., Jr., to Identix Incorporated. Fingerprint imaging apparatus. 4,537,484, Cl. 354-62.000.
Fox, Joseph R.: *See*—
Tenhover, Michael A.; Henderson, Richard S.; and Fox, Joseph R., 4,537,625, Cl. 75-0.50A.
Fraden, Jacob, to Healthcheck Corporation. Power switch. 4,538,074, Cl. 307-126.000.
Francalanci, Franco: *See*—
Fos , Marco; Francalanci, Franco; Gardano, Andrea; and Bencini, Elena, 4,537,970, Cl. 546-319.000.
Francel, Josef; Horn. Uriah; and Stewart, Daniel R., to Owens-Illinois, Inc. Lead-free and cadmium-free glass frit compositions for glazing, enameling and decorating. 4,537,862, Cl. 501-14.000.
Franckowiak, Gerhard: *See*—
Heiker, Fred R.; Stoltefuss, Jurgen; Franckowiak, Gerhard; Schramm, Matthias; Thomas, Gunter; and Gross, Rainer, 4,537,881, Cl. 514-25.000.
Franz Plasser Bahnbaumaschinen Industriegesellschaft m.b.H.: *See*—
Theurer, Josef, 4,537,135, Cl. 104-12.000.
Franzen, Torsten A. H.: *See*—
Henriksson, Sven-Erik D.; Ahrel, Bo A.; Svensson, Claes G. S.; and Franzen, Torsten A. H., 4,537,655, Cl. 162-23.000.
Fredd, John V., to Otis Engineering Corporation. Valve. 4,537,383, Cl. 251-58.000.
Frederick, Russell A. Corner panel assembly. 4,536,995, Cl. 52-27.000.
Frees, David. *See*—
Schwartz, Edwin; and Frees, David, 4,537,216, Cl. 137-514.000.
Frei, Karl, to Telsonic AG Fur Elektronische Entwicklung Und Fabrikation. Apparatus for generating and radiating ultrasonic energy. 4,537,511, Cl. 366-127.000.
Freige, Diab E.; Lockwood, John J.; Ramsay, Michael; and Keely, Leroy B., to Convergent Technologies, Inc. Modular power supply system. 4,538,073, Cl. 307-33.000.
French, Alan. Earphone assembly. 4,538,034, Cl. 179-182.00R.
Frey, Elmer J.: *See*—
Sharp, Harper E.; Spiegel, Leo; Masters, Richard M.; Frey, Elmer J.; Howatt, John R.; and Walker, Gary E., 4,537,067, Cl. 73-151.000.
Friedrich, Jaromir: *See*—
Krepela, Josef; and Friedrich, Jaromir, 4,537,386, Cl. 251-302.000.
Frito-Lay, Inc.: *See*—
Bernard, Donald C., 4,537,786, Cl. 426-438.000.
Frost, Heinz-Helmut: *See*—
Ehlscheid, Gunter; and Frost, Heinz-Helmut, 4,537,588, Cl. 493-342.000.
Fry, Daniel J. Reloader for muzzle loaders. 4,536,983, Cl. 42-90.000.
Fuchs, Helmut, to Textilmaschinenfabrik Dr. Ernst Fehrer Aktiengesellschaft. Process and apparatus for spinning a staple fiber joined to a previously spun yarn. 4,537,020, Cl. 57-263.000.
Fuji Electric Company, Ltd.: *See*—
Arai, Akio, 4,537,849, Cl. 430-85.000.
Shiino, Kouji; Hashimoto, Nobuo; Wada, Shozo; Nakamura, Keijiro; Izumi, Akio; Sato, Toshio; and Matsui, Takashi, 4,537,648, Cl. 156-351.000.
Fuji Jukogyo Kabushiki Kaisha: *See*—
Sakai, Tatsuo, 4,537,163, Cl. 123-52.0MC.
Fuji Photo Film Co., Ltd.: *See*—
Kasuga, Akira; Yamamoto, Nobuyuki; and Miyatsuka, Hajime, 4,537,833, Cl. 428-328.000.
Ohba, Hisao; Uchida, Toshio; Ohashi, Azusa; and Kita, Nobuyuki, 4,537,496, Cl. 355-10.000.
Takeda, Hideo, 4,537,801, Cl. 427-356.000.
Tamura, Kaoru, 4,537,307, Cl. 206-455.000.
Tsutomu, Kimura; Nakayama, Hideo; and Fuseda, Yuichi, 4,538,179, Cl. 358-166.000.
Fuji Xerox Co., Ltd.: *See*—
Asanuma, Tetsu; and Inagaki, Satoru, 4,538,052, Cl. 219-469.000.
Kume, Hiroshi, 4,538,261, Cl. 370-85.000.
Uchida, Hiroyasu, 4,538,267, Cl. 371-20.000.
Fujihata, Isao: *See*—
Shimpo, Tetsuhiko; and Fujihata, Isao, 4,538,101, Cl. 323-272.000.
Fujii, Akio: *See*—
Umezawa, Hamao; Fujii, Akio; Muraoka, Yasuhiko; Nakatani, Tokuji; Fukuoka, Takeyo; and Takahashi, Katsutoshi, 4,537,880, Cl. 514-19.000.
Fujikin International, Inc.: *See*—
Sekoguchi, Kotohiko; and Sonoda, Yoshiteru, 4,537,078, Cl. 73-744.000.
Fujimatsu, Wataru: *See*—
Asano, Masao; Fujimatsu, Wataru; Matsumoto, Kazumasa; Murata, Hideki; Sato, Toshihiko; and Watanabe, Kenji, 4,537,824, Cl. 428-323.000.
Fujiso, Tokuo: *See*—
Ohmori, Tadashi; Fujiso, Tokuo; Yasui, Eiji; Nomura, Soichi; and Aizawa, Yukio, 4,537,872, Cl. 502-230.000.
Fujita, Kazunori: *See*—
Okada, Makoto; and Fujita, Kazunori, 4,537,278, Cl. 181-227.000.
Fujita, Kazuyoshi: *See*—
Takayama, Yoshihisa; Gotoh, Kunihiko; Ito, Akihiko; Yamamura, Takeshi; and Fujita, Kazuyoshi, 4,536,949, Cl. 29-578.000.
Fujitsu Limited: *See*—
Nakano, Motoo, 4,538,166, Cl. 357-23.600.
Shimada, Hiroshi, 4,538,076, Cl. 307-475.000.
Sugo, Yasuhisa; and Takeshima, Tohru, 4,538,244, Cl. 365-155.000.
Takagi, Masayuki; Mugiya, Hiroshi; and Komaju, Shigeru, 4,538,102, Cl. 323-349.000.
Takayama, Yoshihisa; Gotoh, Kunihiko; Ito, Akihiko; Yamamura, Takeshi; and Fujita, Kazuyoshi, 4,536,949, Cl. 29-578.000.
Yano, Yasuhiro; Umino, Isamu; Ohsawa, Zenichi; and Ozaki, Takayuki, 4,538,121, Cl. 331-25.000.
Fujitsu Ten Limited: *See*—
Tanigawa, Kou; Masuda, Jiro; Nakamura, Kazumasa; and Hayashi, Kazuhiko, 4,537,272, Cl. 180-176.000.
Fujiyama, Shigeo; and Ogata, Yasuhiro, to Mitsubishi Denki Kabushiki Kaisha. Semi-closed type refrigerant compressing machine. 4,537,046, Cl. 62-505.000.
Fukai, Toshiyuki: *See*—
Tsuchida, Yutaka; and Fukai, Toshiyuki, 4,537,240, Cl. 164-430.000.
Fukatani, Yasunobu, to Kabushiki Kaisha Daikin Seisakusho. Facing assembly of a friction clutch disc. 4,537,299, Cl. 192-107.00C.
Fukawa, Susumu: *See*—
Ando, Toshihiko; Ito, Norifumi; Matsubara, Tetsuyuki; Ichikawa, Kozo; Fukawa, Susumu; and Maeda, Tetsuo, 4,537,954, Cl. 528-481.000.
Fukaya, Yasuhiro: *See*—
Okamoto, Eiji; Fukaya, Yasuhiro; and Chikami, Michio, 4,537,247, Cl. 165-104.140.
Fukuda, David S.: *See*—
Abbott, Bernard J.; Debono, Manuel; and Fukuda, David S., 4,537,717, Cl. 260-112.50R.
Fukuhara, Tetsukazu: *See*—
Tanaka, Masaho; Shishido, Tomio; Fukuhara, Tetsukazu; Yao, Yugo; Kobayashi, Kunihilo; and Inoue, Yoshio, 4,538,042, Cl. 219-58.000.
Fukuoka, Takeyo: *See*—
Umezawa, Hamao; Fujii, Akio; Muraoka, Yasuhiko; Nakatani, Tokuji; Fukuoka, Takeyo; and Takahashi, Katsutoshi, 4,537,880, Cl. 514-19.000.
Fukushima, Akira; and Sugimoto, Yutaka, to Kabushiki Kaisha Komatsu Seisakusho. Hydraulic connection means between a vehicle body and a track-mounted hydraulic motor. 4,537,268, Cl. 180-9.100.
Fullam, Harold T.: *See*—
Rohrmann, Charles A.; and Fullam, Harold T., 4,537,835, Cl. 423-502.000.
Funabashi, Katsunori, to Honda Giken Kogyo Kabushiki Kaisha. Radiator system for motorcycle. 4,537,273, Cl. 180-229.000.
Funabashi, Tetsuji; and Kobayashi, Shingo, to Kabushiki Kaisha Komatsu Seisakusho. Blade control device. 4,537,259, Cl. 172-4.500.
Furukawa, Hiroshi: *See*—
Takao, Hiroyoshi; Yamamoto, Keisaku; Imai, Akio; Yoshida, Nobuyuki; Furukawa, Hiroshi; Saito, Yuichi; and Okumura, Akio, 4,537,936, Cl. 525-236.000.
Furutsu, Akira, to Japan Bano'k Co., Ltd. Device for connecting ends of filamentary fastener. 4,536,933, Cl. 29-235.000.
Fuseda, Yuichi: *See*—
Tsutomu, Kimura; Nakayama, Hideo; and Fuseda, Yuichi, 4,538,179, Cl. 358-166.000.
Fuss, Peter: *See*—
Sucrow, Wolfgang; Schatull, Wolfgang; and Fuss, Peter, 4,537,698, Cl. 252-299.610.
Fuwa, Shigehiro: *See*—
Shimizu, Masami; Yoshikawa, Hisao; Kimura, Sosaku; Shiba, Kazuo; Maeno, Fumio; Fuwa, Shigehiro; and Mihara, Kuniyuki, 4,536,993, Cl. 51-165.800.
Fuziwara, Osami: *See*—
Ito, Katsumi; and Fuziwara, Osami, 4,537,271, Cl. 180-131.000.
Gabe, Julian: *See*—
Pikarski, Michael; Gabe, Julian; and Dykman, Edmund, 4,537,992, Cl. 564-437.000.
Gabel, Eike; Blank, Heinz U.; and Behre, Horst, to Bayer Aktiengesellschaft. Process for the simultaneous recovery of 4-hydroxy-diphenyl and 4,4'-dihydroxydiphenyl. 4,538,007, Cl. 568-751.000.
Gabrielli, Luciano; and Sposini, Maurizio, to Cselt Centro Studi e Laboratori Telecommunicazioni SpA. Variable-band switching system for voice and data communication. 4,538,263, Cl. 370-86.000.
Gadelius Kabushiki Kaisha: *See*—
Okamoto, Eiji; Fukaya, Yasuhiro; and Chikami, Michio, 4,537,247, Cl. 165-104.140.
Gaffar, Abdul; Davis, Calvin B.; Donohue, John J.; and Moy, Debbie, to Colgate-Palmolive Company. Peroxydiphosphate toothpaste composition. 4,537,765, Cl. 424-53.000.
Gaide, Albert, to Mistral Windsurfing AG. Apparatus for the stabilizing of the direction of travel of watercraft, specifically a sword or fin for sailboards. 4,537,143, Cl. 114-39.000.
Gaisch, Helmut; Ghiste, Patrick D. L.; and Schulthess, Dieter, to Fabriques de Tabac Reunies S.A. Method of tobacco treatment to produce flavors. 4,537,204, Cl. 131-274.000.
Galante, Jorge O.; and Rostoker, William. Hip prosthesis with flared porous bony ingrowth pads. 4,536,894, Cl. 623-22.000.
Gale, Ronald S.; Bristol, William E.; and Noonan, Carroll, to Willamette Industries, Inc. Method and apparatus for applying coupon strips to paper bags. 4,537,586, Cl. 493-220.000.
Gallick-Whitaker, Nancy G., to Eli Lilly and Company. Method of preparing 4aR,8aR-5-permissibly substituted-6-oxo-octahydro-1H(and 2H)-pyrazolo[3,4-g]quinolines, useful as intermediates. 4,537,965, Cl. 546-82.000.

Gallup, Darrell L.; and Jost, John W., to Union Oil Company of California. Control of metal-containing scale deposition from high temperature brine. 4,537,684, Cl. 210-696.000.
Galluzzi, Giovanni, to Giulio Fiocchi S.p.A. Self-propelling projectile for firearms. 4,537,134, Cl. 102-380.000.
Galvin, Aaron A.: *See*—
Harvey, Roy L.; Griffin, Kevin J.; Galvin, Aaron A.; and Auerbach, Louis H., 4,538,138, Cl. 340-521.000.
Ganellin, Charon R.: *See*—
Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,537,779, Cl. 514-275.000.
Gardano, Andrea: *See*—
Foa , Marco; Francalanci, Franco; Gardano, Andrea; and Bencini, Elena, 4,537,970, Cl. 546-319.000.
Garg, Shyam G.: *See*—
Bohr, Mark T.; Yu, Ken K.; Yau, Leo D.; and Garg, Shyam G., 4,536,947, Cl. 29-576.00C.
Gargini, Eric J.; and Baker, Henry L., to Communications Patents Limited. Two-way subscriber TV system with multiple subscriber's sets. 4,538,174, Cl. 358-86.000.
Garitty, James P.: *See*—
Sun, Shan C.; and Garitty, James P., 4,538,196, Cl. 361-64.000.
Gartner, Karl, to Yoshida Kogyo K. K. Thermal insulating window for application in curtain walls. 4,537,000, Cl. 52-235.000.
Gates, Charles C., Jr.: *See*—
Peltzman, William S.; Rohlfing, Raymond A.; and Gates, Charles C., Jr., 4,537,736, Cl. 264-130.000.
Gates Rubber Company, The: *See*—
Peltzman, William S.; Rohlfing, Raymond A.; and Gates, Charles C., Jr., 4,537,736, Cl. 264-130.000.
Gaucher, Michel M. G., to Electronique Serge Dassault. Endless drive belt apparatus for processing card tickets with magnetic track. 4,537,125, Cl. 101-93.040.
Gaussens, Gilbert; and Lemaire, Francis, to Commissariat a l'Energie Atomique. Process for the production of a cation exchange diaphragm and the diaphragm obtained by this process. 4,537,668, Cl. 204-159.170.
Gavin, Thomas O.: *See*—
Heinemann, Frederick F.; and Gavin, Thomas O., 4,537,129, Cl. 101-415.100.
Gazzoli, Italo; and Keller, Frank, to General Telephone of Florida. Apparatus for use with key telephone system with wireless telephone device. 4,538,028, Cl. 179-2.0EA.
Gazzoli., Italo; and Keller, Frank, to General Telephone of Florida. Apparatus for use with key telephone system with wireless telephone device. 4,538,029, Cl. 179-2.0EA.
Geiger, Kurt: *See*—
Burger, Arnulf; Scharff, Karl-Heinz; Geiger, Kurt; Schnee, Gunther; and Pieper, Hartwig, 4,536,909, Cl. 15-4.000.
Geipel, Werner: *See*—
Billet, Reinhard; Kober, Rainer; Mackowiak, Jerzy; and Geipel, Werner, 4,537,731, Cl. 261-94.000.
Gelbard, Edward, to Wilverly Mansions I.B.V. Bag dispensing system. 4,537,330, Cl. 221-26.000.
Gelbein, Abraham P.: *See*—
Blum, David B.; and Gelbein, Abraham P., 4,537,876, Cl. 502-342.000.
Gem Products, Inc.: *See*—
Cowan, Arnold A., 4,537,214, Cl. 137-318.000.
General Electric Company: *See*—
Breen, Thomas B., 4,538,197, Cl. 361-71.000.
Bussink, Jan; DeMunck, Johannes W. J.; and Marie van Abeelen, Petrus C. A., 4,537,930, Cl. 524-505.000.
Crivello, James V., 4,537,854, Cl. 430-283.000.
Emeterio, Eloy V.; Deallenbach, Robert E.; O'Connor, Martin F.; and Klufas, Oleg, 4,537,560, Cl. 416-198.00A.
Germano, Carmen P.; and Davenport, John M., 4,538,087, Cl. 310-332.000.
Keane, John J.; and Pauze, Denis R., 4,537,804, Cl. 427-118.000.
Luxon, Bruce A., 4,537,925, Cl. 524-151.000.
Pfeifer, George F., 4,538,078, Cl. 307-592.000.
Scheibengraber, Karl J., 4,538,289, Cl. 378-20.000.
Siemers, Paul A.; Kopp, Robert W.; and Jackson, Melvin R., 4,537,742, Cl. 419-8.000.
Syed, Asif A., 4,537,630, Cl. 73-589.000.
Yerman, Alexander J., 4,538,170, Cl. 357-80.000.
General Telephone of Florida: *See*—
Gazzoli, Italo; and Keller, Frank, 4,538,028, Cl. 179-2.0EA.
Gazzoli, Italo; and Keller, Frank, 4,538,029, Cl. 179-2.0EA.
Gentile, Anthony J.: *See*—
Cropper, George D.; and Gentile, Anthony J., 4,537,025, Cl. 60-39.281.
Georg Neumann GmbH: *See*—
Kern, Otmar, 4,538,255, Cl. 369-51.000.
George, E. Victor, to United States of America, Energy. Q-Switched Raman laser system. 4,538,274, Cl. 372-3.000.
George, Kurudamannil A., to Proctor & Schwartz, Inc. Skin removal apparatus for almonds. 4,537,122, Cl. 99-516.000.
George, Richard D.: *See*—
Brockway, Patrick H.; Lehr, Howard C.; and George, Richard D., 4,537,440, Cl. 296-108.000.
Georgia Tech Research Institute: *See*—
Delahoussaye, Ronald D.; and Kelly, Gary W., 4,537,415, Cl. 280-242.0WC.
Gergely, John S., to Conoco Inc. Apparatus and method for generating light in the near ultraviolet to infrared range. 4,538,278, Cl. 372-70.000.
Gergely, John S.: *See*—
Reust, Dennis K.; and Gergely, John S., 4,538,230, Cl. 364-433.000.
Germano, Carmen P.; and Davenport, John M., to General Electric Company. Alternating current driven piezoelectric latching relay and method of operation. 4,538,087, Cl. 310-332.000.
Geroh GmbH, Mechanische Systeme: *See*—
Brendel, Richard; and Conrad, Herbert, 4,536,921, Cl. 24-132.0WL.
Gerretz, Richard: *See*—
Jansen, Herbert; Schiffers, Hans-Gunter; and Gerretz, Richard, 4,537,407, Cl. 277-2.000.
Gerry, Martin E. Bipolar magnetic pulse activated ignition system. 4,537,175, Cl. 123-649.000.
Gewerkschaft Eisenhutte Westfalia: *See*—
Weirich, Walter; and Dettmers, Michael, 4,537,221, Cl. 137-637.200.
Geze GmbH: *See*—
Storandt, Ralf; and Mettenleiter, Karl, 4,536,916, Cl. 16-48.500.
Ghiste, Patrick D. L.: *See*—
Gaisch, Helmut; Ghiste, Patrick D. L.; and Schulthess, Dieter, 4,537,204, Cl. 131-274.000.
Giannuzzi, Louis N. Anchor bolt assembly. 4,537,541, Cl. 411-55.000.
Gibson, Ronald A.: *See*—
Crain, Stephen F.; Gray, Steven H.; Green, Michael L.; and Gibson, Ronald A., 4,538,222, Cl. 364-172.000.
Gielis, Gerardus C. M.; and Van Kessel, Antoon M. M., to U.S. Philips Corporation. FM-receiver for receiving FM-signals with transmission identification. 4,538,285, Cl. 375-104.000.
Giles, Oley; and Bragg, Duncan D., to Borg-Warner Corporation. Low emission valve. 4,537,385, Cl. 251-214.000.
Gilhaus, Heinz, to Credo Stahlwarenfabrik Gustav Kracht, Firma. Callous-removing skin-file. 4,537,207, Cl. 132-76.400.
Gillard, John W.: *See*—
Belanger, Patrice C.; and Gillard, John W., 4,537,906, Cl. 514-532.000.
Gillberg-La Force, Gunilla E.; and Kravas, Helen A., to Celanese Corporation. Flow-regulated latex systems. 4,537,931, Cl. 524-510.000.
Gilson, Jean-Pierre, to UOP Inc. Method of preparing silicate composition. 4,537,866, Cl. 502-70.000.
Giordano, Claudio: *See*—
Castaldi, Graziano; and Giordano, Claudio, 4,537,979, Cl. 549-347.000.
Giragosian, Paul S. Firearm assembly. 4,536,981, Cl. 42-69.00B.
Girard, Theodore A., to Glyco, Inc. Method of enhancing solubility of halogenated hydantoins. 4,537,697, Cl. 252-90.000.
Girty, Vernon L. Boot removal apparatus. 4,537,337, Cl. 223-114.000.
Giulio Fiocchi S.p.A.: *See*—
Galluzzi, Giovanni, 4,537,134, Cl. 102-380.000.
Giusto, Pietro P., to CSELT Centro Studi e Laboratori Telecomunicazioni SPA. Circuit recovering the carrier of a signal amplitude and phase modulated by digital signals. 4,538,111, Cl. 329-122.000.
Glass, Andrew S.: *See*—
Baltes, Heinrich P.; Glass, Andrew S.; and Jauch, Karl, 4,537,504, Cl. 356-71.000.
Glass, John P.: *See*—
Hollander, Edward F., Jr., 4,537,308, Cl. 206-484.000.
Glastra, Hendrik: *See*—
Volker, Wolfgang; and Glastra, Hendrik, 4,537,043, Cl. 62-239.000.
Gleyze, Rene : *See*—
Pebeyre, Pierre-Jean; Gleyze, Rene ; and Montant, Charles, 4,537,613, Cl. 71-5.000.
Gloth, Richard E.; Tazuma, James J.; and Smith, Robert A., to Goodyear Tire & Rubber Company, The. Polymeric compounds prepared from diphenylamine and dialkylalkenylbenzene or dihydroxyalkylbenzene. 4,537,952, Cl. 528-392.000.
Gluckstern, Robert L.; Holsinger, Ronald F.; and Lown, Robert R., to Field Effects, Inc. Tunable segmented ring magnet and method of manufacture. 4,538,130, Cl. 335-306.000.
Glumac, Nick P. Mobile storage platform and liftable bed trailer. 4,537,378, Cl. 248-163.100.
Glyco, Inc.: *See*—
Girard, Theodore A., 4,537,697, Cl. 252-90.000.
Goetz, Norbert; Laas, Harald; Tavs, Peter; Hupfer, Leopold; and Baer, Karl, to BASF Aktiengesellschaft. Preparation of substituted phenols. 4,538,009, Cl. 568-799.000.
Golar Metall, Hilco Industries A/S: *See*—
Eike, Einar, 4,536,999, Cl. 52-208.000.
Gold Band Ice Cream, Inc.: *See*—
Bero, Vernon L.; and Schultz, Fredrick W., 4,537,121, Cl. 99-450.400.
Golden, Douglas B.: *See*—
Hamilton, Scott B.; and Golden, Douglas B., 4,538,142, Cl. 340-667.000.
Golinsky, Joseph J., Jr. Exercise apparatus for developing arm and wrist muscles. 4,537,394, Cl. 272-117.000.
Gomez, I. Luis, to Monsanto Company. Laminates comprising plasticized polyvinyl butyral interlayers. 4,537,828, Cl. 428-412.000.
Goodman, Phillip M.: *See*—
Charney, Joseph C.; Goodman, Phillip M.; and Morgan, Robert H., 4,537,522, Cl. 401-218.000.
Goodrich, Edgar R., Jr.; and Navratil, Philip, to Motorola, Inc. Method and apparatus for translating a predetermined Hamming code to an expanded class of Hamming codes. 4,538,270, Cl. 371-37.000.

Goodyear Tire & Rubber Company, The: *See—*
Colvin, Howard A.; Muse, Joel, Jr.; and Hollingshead, William S., 4,538,002, Cl. 568-650.000.
Gloth, Richard E.; Tazuma, James J.; and Smith, Robert A., 4,537,952, Cl. 528-392.000.

Goralnik, Charles D. Dimmer and starting circuits for a fluorescent lamp. 4,538,092, Cl. 315-58.000.

Gorgenyi, Frigyes: *See—*
Deak, Gyula; Zara nee Kaczian, Erzsebet; Gyorgy, Lajos; Fekete, Marton; Doda, Margit; Seregi, Andras; Kanyicska, Bela; Toth nee Pecsi, Erzsebet; Horvath nee Gaal, Maria; Manyai, Sandor; Gorgenyi, Frigyes; and Vaszovics nee Reichmann, Gyorgyi, 4,537,895, Cl. 514-307.000.

Gossi, Hans. System for efficient service water heating. 4,537,348, Cl. 237-8.00A.

Goto, Satoshi: *See—*
Takahashi, Jiro; Sawada, Kiyoshi; Kinoshita, Akira; Komamura, Tawara; Goto, Satoshi; and Sasaki, Osamu, 4,537,847, Cl. 430-58.000.

Gotoh, Kunihiko: *See—*
Takayama, Yoshihisa; Gotoh, Kunihiko; Ito, Akihiko; Yamamura, Takeshi; and Fujita, Kazuyoshi, 4,536,949, Cl. 29-578.000.

Gotoh, Miyuki, to Nissan Motor Co., Ltd. System for controlling warp let-off motion of weaving machine during machine downtime. 4,537,226, Cl. 139-100.000.

Gotoh, Yoshitomo; and Iwamoto, Kiyofumi, to Hitachi, Ltd. Composite circuit breaker. 4,538,039, Cl. 200-144.00B.

Gottlieb Weinmann Gerate fur Medizin und Arbeitsschutz G.m.b.H. & Co.: *See—*
Blumensaadt, Hans C., 4,537,191, Cl. 128-205.130.

Gould Inc.: *See—*
Prestel, David J., 4,538,140, Cl. 340-556.000.

Gouw, T. H., to Chevron Research Company. Removal of hydrogen sulfide from elemental sulfur by a countercurrent wet steam process. 4,537,605, Cl. 55-48.000.

Grabmaier, Josef: *See—*
Douklias, Nikolaos; and Grabmaier, Josef, 4,537,611, Cl. 65-18.200.

Graboyes, Herman A., to Atlas Steel Rule Die, Inc. Embosser mounting insert registering means. 4,537,124, Cl. 101-28.000.

Grafwallner, Karl L.: *See—*
Herold, Wolf-Dietrich; Grafwallner, Karl L.; and Keller, Michael, 4,538,070, Cl. 250-504.00R.

Graham, Phyllis: *See—*
Calder, Oliver J., 4,537,355, Cl. 239-119.000.

Grangette, Francoise: *See—*
Zumbrunn, Jean-Pierre; Levielle, Jean; Thomas, Andre ; and Grangette, Francoise, 4,536,907, Cl. 8-149.100.

Grasselli, Robert K.: *See—*
Tenhover, Michael A.; Henderson, Richard S.; and Grasselli, Robert K., 4,537,624, Cl. 75-0.50B.

Grasso, Charles P., to American Cyanamid Company. Process for the preparation of 2-(4-hydroxyphenyl)-3-methylbutyric acid. 4,537,988, Cl. 562-478.000.

Gray, Bruce; Soundaranathan, Kasiviswanatha; and VanGieson, Franklin D., to National Semiconductor Corporation. Process for producing CMOS structures with Schottky bipolar transistors. 4,536,945, Cl. 29-571.000.

Gray, Steven H.: *See—*
Crain, Stephen F.; Gray, Steven H.; Arnold, Edward P.; and Dodd, Timothy J., 4,538,221, Cl. 364-172.000.
Crain, Stephen F.; Gray, Steven H.; Green, Michael L.; and Gibson, Ronald A., 4,538,222, Cl. 364-172.000.

Greb, Wolfgang; Christophliemk, Peter; and Schroder, Christine, to Henkel Kommanditgesellschaft auf Aktien. Antacids containing zeolitic molecular sieves. 4,537,771, Cl. 424-154.000.

Green, Michael L.: *See—*
Crain, Stephen F.; Gray, Steven H.; Green, Michael L.; and Gibson, Ronald A., 4,538,222, Cl. 364-172.000.

Green, Michael P.: *See—*
Wise, Joseph A.; and Green, Michael P., 4,538,024, Cl. 174-117.00F.

Greenberg, Mitchell H. Portable and compactible scale. 4,537,266, Cl. 177-208.000.

Greenshields, James N., to Imperial Chemical Industries Limited. Acetals. 4,537,980, Cl. 549-370.000.

Greenwald, Edward H., Sr. Process for removing sulfur and ash from coal. 4,537,599, Cl. 44-1.05R.

Gregoire, Dennis: *See—*
Kambanis, Stamatis M.; Berchem, Antoine; Gregoire, Dennis; and Rybicky, Jaroslav, 4,537,941, Cl. 527-403.000.

Gretz, Ronald D.: *See—*
Thomas, John E.; Gretz, Ronald D.; and Tippins, George W., 4,537,643, Cl. 148-12.00R.

Griebel, Francis J.: *See—*
Endres, Douglas W.; McDaniel, Kenneth D., Jr.; and Griebel, Francis J., 4,537,281, Cl. 182-2.000.

Griffin, Kevin J.: *See—*
Harvey, Roy L.; Griffin, Kevin J.; Galvin, Aaron A.; and Auerbach, Louis H., 4,538,138, Cl. 340-521.000.

Griffin, Michael E., to F & M Trading Company. Knife and/or steel storage unit. 4,537,315, Cl. 211-70.600.

Griffith, Ronald C.; and Kinsolving, Clyde R., to Pennwalt Corporation. Herpes II treatment. 4,537,908, Cl. 514-659.000.

Griffiths, Trevor J.: *See—*
Sharpe, Raymond; Griffiths, Trevor J.; and Hunt, Peter, 4,537,578, Cl. 464-31.000.

Grinberg, Jan; and Little, Michael J., to Hughes Aircraft Company. Liquid crystal pixel driver circuit and matrix display. 4,537,471, Cl. 350-333.000.

Griswold, Azel A., to Reeves Brothers, Inc. Process for rapid curing of polyether polyurethane foam. 4,537,912, Cl. 521-53.000.

Groll, Manfred; and Ockelmann, Dieter, to Bayer Aktiengesellschaft. Cu-Pc dyestuffs. 4,537,721, Cl. 260-242.200.

Groom, James S.; and LaFleur, Paul J., Jr., to Package Machinery Company. Packaging machine with rotary actuated sealing jaws. 4,537,012, Cl. 53-552.000.

Grosjean, William C., to Solar Turbines, Incorporated. Turbine engines. 4,537,024, Cl. 60-39.161.

Gross, Franz; Wahl, Georg; and Nicoll, Andrew R., to BBC Aktiengesellschaft Brown, Boveri & Cie. High-temperature protection layer. 4,537,744, Cl. 420-446.000.

Gross, Rainer: *See—*
Heiker, Fred R.; Stoltefuss, Jurgen; Franckowiak, Gerhard; Schramm, Matthias; Thomas, Gunter; and Gross, Rainer, 4,537,881, Cl. 514-25.000.

Grow Group, Inc.: *See—*
Kivel, Daniel M.; and Weber, Gerhard M., 4,537,926, Cl. 524-388.000.

Grow, Robert M., to Burroughs Corp. Bandwidth allocation in a token controlled loop communications network. 4,538,147, Cl. 340-825.050.

Gruber, Robert J.: *See—*
Yourd, Raymond A., III; Majumdar, Debesh; and Gruber, Robert J., 4,537,848, Cl. 430-110.000.

Grumman Aerospace Corporation: *See—*
Kircher, Hartmann J., 4,537,469, Cl. 350-96.240.

Gruning, Burghard; Holtschmidt, Ulrich; and Koerner, Gotz, to TH. Goldschmidt AG. Organopolysiloxanes with Bunte salt groups, their synthesis and use for the surface treatment of inorganic or organic materials. 4,537,595, Cl. 8-115.600.

Grychtol, Klaus; and Baumann, Hans, to BASF Aktiengesellschaft. Unsymmetrical 1:2 chromium complex of a monoazo dyestuff and a disazo dyestuff which is non-fiber reactive and contains no sulfonamido or amino groups. 4,537,955, Cl. 534-696.000.

Gsponer, Arnold; Huber, Werner; and Petrovic, Milan, to Buhler - Miag GmbH. Deviating station for handling arrangement, and handling arrangement provided therewith. 4,537,302, Cl. 198-626.000.

GTE Automatic Electric Incorporated: *See—*
Edwards, Ivan L.; and Macrander, Max S., 4,538,272, Cl. 371-61.000.
Reimer, William A., 4,538,209, Cl. 361-395.000.

GTE Communication Systems Corporation: *See—*
Bertellotti, Ansano; and Traina, Anthony, 4,538,211, Cl. 361-415.000.

GTE Communications Products Corporation: *See—*
McNesby, John B.; and Krys, Joseph F., 4,538,286, Cl. 375-112.000.

GTE Laboratories Incorporated: *See—*
Ditchek, Brian M.; and Middleton, Thomas R., 4,537,323, Cl. 220-2.10R.

GTE Products Corporation: *See—*
Ritsko, Joseph E.; and Acla, Howard L., 4,537,750, Cl. 423-65.000.

Gudgeon, Bryan, to International Computers Limited. Devices for and methods of mounting integrated circuit packages on a printed circuit board. 4,536,955, Cl. 29-840.000.

Guenthner, Russell W.: *See—*
Circello, Joseph C.; and Guenthner, Russell W., 4,538,238, Cl. 364-746.000.

Guglielmo, Jean. Machine for truing electrical collectors and the like. 4,536,915, Cl. 15-345.000.

Guillaume, Jean-Luc, to Societe a Responsabilite Limitee styled: Speri-France. Waterproof fabric and fabrication method thereof. 4,537,817, Cl. 428-260.000.

Gunda, Rajamouli; McCarty, Michael R.; and Rode, Melvin A., to Vickers, Incorporated. Power transmission. 4,537,029, Cl. 60-390.000.

Gunn, Walter H.; and Kennedy, Alexander W. Corrosion resistant metal composite with metallic undercoat and chromium topcoat. 4,537,837, Cl. 428-621.000.

Gupta, Mool C.; Wrobel, Joseph J.; and Howe, Dennis G., to Eastman Kodak Company. Ceramic overcoated optical recording element. 4,538,159, Cl. 346-135.100.

Gustavsson, Stig I.: *See—*
Claeson, Carl G.; and Gustavsson, Stig I., 4,537,896, Cl. 514-330.000.

Gutschmit, Alan; and York, Paul W., to Monarch Knitting Machinery Corp.; and Monatex S.A. Pile loop forming and cutting elements for circular knitting machines. 4,537,048, Cl. 66-93.000.

Guyer, John R.: *See—*
Keesee, Kenneth M.; and Guyer, John R., 4,537,328, Cl. 220-445.000.

Gyorgy, Lajos: *See—*
Deak, Gyula; Zara nee Kaczian, Erzsebet; Gyorgy, Lajos; Fekete, Marton; Doda, Margit; Seregi, Andras; Kanyicska, Bela; Toth nee Pecsi, Erzsebet; Horvath nee Gaal, Maria; Manyai, Sandor; Gorgenyi, Frigyes; and Vaszovics nee Reichmann, Gyorgyi, 4,537,895, Cl. 514-307.000.

Gyugyi, Laszlo, to Westinghouse Electric Corp. Adjustable frequency AC motor drive using an unrestricted frequency changer system. 4,538,220, Cl. 363-161.000.

H. J. Langen & Sons Limited: *See—*
Langen, Marinus J. M., 4,537,587, Cl. 493-315.000.

Haefliger, William W.: *See—*
Parkinson, Delbert J., 4,536,979, Cl. 40-159.000.

Haesters, Hermann, to Ford Motor Company. Ventilation arrangement for a tailgate. 4,537,115, Cl. 98-2.180.
Hagen, Wilhelm F.: *See*—
Summers, Mark A.; Hagen, Wilhelm F.; and Boyd, Robert D., 4,537,475, Cl. 350-448.000.
Hahn, Robert E.: *See*—
Matteucci, John S.; Snyder, James K.; and Hahn, Robert E., 4,536,998, Cl. 52-171.000.
Haji, Katsumi: *See*—
Nakajima, Hirohito; Haji, Katsumi; Shibata, Yoji; and Kosuge, Wataru, 4,538,176, Cl. 358-86.000.
Hakiri, Minoru: *See*—
Takigawa, Nobuhiro; Watanabe, Hideo; Kawasaki, Kanzirou; Kubo, Keishi; Hakiri, Minoru; and Kawamura, Eiichi, 4,538,164, Cl. 346-209.000.
Halcon SD Group, Inc., The: *See*—
Rizkalla, Nabil, 4,537,871, Cl. 502-161.000.
Haldric, Bernard, to NACAM. Device for detecting the position of a shaft in a coupling element, and in particular a universal joint yoke. 4,537,523, Cl. 403-12.000.
Hall, David A., to Eli Lilly and Company. N-substituted-2-(R)-(sulfinic acid)-3-(S)-(acylamino)-4-oxo-azetidines and process. 4,537,720, Cl. 260-239.00A.
Hall, James E.; and Schulz, Donald N., to Firestone Tire & Rubber Company, The. Process for production of polymers having increased 1,2-microstructure. 4,537,939, Cl. 526-179.000.
Hall, John T.: *See*—
Radmore, Robert R.; and Hall, John T., 4,537,368, Cl. 242-58.600.
Hall, Joseph E.: *See*—
Roberts, Charles G.; and Hall, Joseph E., 4,538,287, Cl. 377-60.000.
Halliburton Company: *See*—
Beck, Harold K., 4,537,258, Cl. 166-374.000.
Crain, Stephen F.; Gray, Steven H.; Arnold, Edward P.; and Dodd, Timothy J., 4,538,221, Cl. 364-172.000.
Crain, Stephen F.; Gray, Steven H.; Green, Michael L.; and Gibson, Ronald A., 4,538,222, Cl. 364-172.000.
Hamaji, Yukio: *See*—
Okabe, Shinsei; Komatsu, Hiroshi; Hamaji, Yukio; Kojima, Shozo; and Kato, Yoshiharu, 4,537,865, Cl. 501-135.000.
Hamill, Robert L.; and Kastner, Ralph E., to Eli Lilly and Company. A47934 Antibiotic and process for production thereof. 4,537,879, Cl. 514-9.000.
Hamilton, Scott B.; and Golden, Douglas B. Signal seat for children. 4,538,142, Cl. 340-667.000.
Hamm, Josef: *See*—
Emmerling, Hans-Jorg; and Hamm, Josef, 4,537,014, Cl. 53-570.000.
Hammer, Friedrich: *See*—
Hinrichs, Walter; Hammer, Friedrich; and Lange, Ludwig, 4,536,938, Cl. 29-527.500.
Hammond, Milton L.: *See*—
Chang, Michael N.; Hammond, Milton L.; Jensen, Norman P.; McDonald, John; and Zambias, Robert A., 4,537,903, Cl. 514-456.000.
Hampton, James E., to Sedco, Inc. Installation and levelling of subsea templates. 4,537,533, Cl. 405-227.000.
Haney, Steven J.; Stulen, Richard H.; and Toly, Norman F., to United States of America, Energy. Manipulator having thermally conductive rotary joint for transferring heat from a test specimen. 4,538,068, Cl. 250-443.100.
Hans, Rudiger: *See*—
Brandenstein, Manfred; and Hans, Rudiger, 4,537,270, Cl. 180-70.100.
Hansen, Guenter: *See*—
Bergmann, Udo; Degen, Helmut; Hansen, Guenter; Krallmann, Reinhold; and Weber, Hans, 4,537,597, Cl. 8-639.000.
Hanson, Derald F.: *See*—
Sherman, Randy J.; and Hanson, Derald F., 4,537,465, Cl. 350-68.000.
Hanson, Oliver D.; Nicolai, Donald R.; and Strong, Les O. Ice applicator for medicinal purposes. 4,537,194, Cl. 128-399.000.
Hanson, William M., to Automotive Products plc. Ball and socket joint. 4,537,524, Cl. 403-140.000.
Hanzawa, Kohtaro: *See*—
Sakurai, Keiichi; Ishida, Hideaki; and Hanzawa, Kohtaro, 4,537,110, Cl. 84-1.260.
Hara, Masahiro: *See*—
Sakai, Toshiyasu; Hara, Masahiro; and Teraura, Nobuyuki, 4,538,060, Cl. 235-472.000.
Hardesty, Edwin C.; and Hardesty, Ronald C., to AT&T Technologies, Inc. Tool for terminating telephone cordage with modular plugs. 4,536,939, Cl. 29-566.400.
Hardesty, Ronald C.: *See*—
Hardesty, Edwin C.; and Hardesty, Ronald C., 4,536,939, Cl. 29-566.400.
Hares, George B.: *See*—
Borrelli, Nicholas F.; Hares, George B.; Smith, Dennis W.; and Wedding, Brent M., 4,537,612, Cl. 65-30.110.
Harper, James M. E.: *See*—
Cuomo, Jerome J.; Harper, James M. E.; and Waters, Gary A., 4,538,067, Cl. 250-396.00R.
Harrell, Bruce W. Multi-purpose detachable pocket system. 4,536,975, Cl. 36-136.000.
Harrington, Edward R.: *See*—
Uffner, William E.; White, Robert N.; and Harrington, Edward R., 4,537,921, Cl. 524-59.000.
Harris, Clifford J.; and Barraclough, Paul. 2,4-Diazabicyclo[3.3.0]octane-3,7-diones. 4,537,972, Cl. 548-302.000.
Harris, William G., to United States of America, Energy. Heat flux limiting sleeves. 4,537,249, Cl. 165-134.00R.
Harrison, John: *See*—
Stevens, Keith D.; Harrison, John; and Kaye, Stanley B., 4,538,171, Cl. 357-81.000.
Harsanyi, Kalman: *See*—
Kreidl, Janos; Farkas nee Kirjak, Maria; Harsanyi, Kalman; Benke, Bela; Rado, Andras; Domany, Gyorgy; Hegedus, Bela; Csongor, Eva; Deutsch nee Juhasz, Ida; and Petho, Hajnalka, 4,537,900, Cl. 514-400.000.
Hartag AG: *See*—
Jetter, Rudolf; and Jetter, Heinz, 4,537,838, Cl. 429-9.000.
Hartl, Werner, to Roller Bearing Company of America. Hub mounting device. 4,537,526, Cl. 403-370.000.
Harvey, Roy L.; Griffin, Kevin J.; Galvin, Aaron A.; and Auerbach, Louis H., to American District Telegraph Company. Integrated security system having a multiprogrammed controller. 4,538,138, Cl. 340-521.000.
Harwood, Jon W.; Clegg, Michael W.; and Treadwell, Mark C., to APX Group, Inc. Hybrid exhaust manifold. 4,537,027, Cl. 60-323.000.
Hashiba, Isao; Nishikimi, Tadashi; and Tsuchiya, Shuji, to Nissan Chemical Industries Ltd. Process for producing 2-(4-hydroxyphenoxy) propionate derivatives. 4,537,984, Cl. 560-061.000.
Hashimoto, Masaru: *See*—
Imanishi, Kazuo; Hashimoto, Masaru; and Mori, Makoto, 4,538,198, Cl. 361-86.000.
Hashimoto, Mitsuru, to Ricoh Co. Ltd. Electrophotographic element containing disazo compound. 4,537,844, Cl. 430-58.000.
Hashimoto, Nobuo: *See*—
Shiino, Kouji; Hashimoto, Nobuo; Wada, Shozo; Nakamura, Keijiro; Izumi, Akio; Sato, Toshio; and Matsui, Takashi, 4,537,648, Cl. 156-351.000.
Haskell of Pittsburgh, Inc.: *See*—
Rice, Thomas E.; and Staropoli, Paul R., 4,537,452, Cl. 312-314.000.
Haslanger, Martin F.: *See*—
Snitman, David L.; Haslanger, Martin F.; and Sprague, Peter W., 4,537,904, Cl. 514-469.000.
Snitman, David L.; Haslanger, Martin F.; and Sprague, Peter W., 4,537,981, Cl. 549-463.000.
Hasskamp, Paul R., to Becton, Dickinson and Company. Dispenser apparatus for simultaneously dispensing predetermined equal volumes of liquid including a disposable dispenser module. 4,537,231, Cl. 141-238.000.
Hassler, Heinrich; Muller, Reiner; Kippenberg, Horst; and Prolss, Norbert, to Siemens Aktiengesellschaft. Method of producing copper-chromium fusion alloys as contact material for vacuum power switches. 4,537,745, Cl. 420-590.000.
Hata, Hideo: *See*—
Yoshimura, Isao; Hata, Hideo; and Kaneko, Takashi, 4,537,935, Cl. 525-222.000.
Hatakeyama, Kenichi; and Inui, Tetsuji, to Nippon Electric Co., Ltd. Electro-magnetic wave absorbing material. 4,538,151, Cl. 343-18.00A.
Hattori, Osamu; and Tamura, Shingo, to Hitachi, Ltd. Pickup device. 4,538,254, Cl. 369-43.000.
Hattori, Tadashi: *See*—
Ootsuka, Yoshinori; Hattori, Tadashi; Yamamoto, Minoru; and Ozaki, Tadashi, 4,537,065, Cl. 73-117.300.
Hattori, Takatoshi, to Mitsubishi Denki Kabushiki Kaisha. Coil inserter. 4,536,954, Cl. 29-736.000.
Hatzell, Paul H. Combined chisel plow, rod weeder and drill. 4,537,261, Cl. 172-44.000.
Haudum, Adolf: *See*—
Hirnbock, Rudolf; and Haudum, Adolf, 4,537,417, Cl. 280-602.000.
Hauni-Werke Korber & Co. KG.: *See*—
Lorenzen, Heinz-Christen; Heitmann, Uwe; Petersen, Kurt-Eckart; and Pinck, Peter, 4,537,206, Cl. 131-281.000.
Hawe, Malcolm; Marshall, David; and Walker, John R. Thermal energy storage compositions. 4,537,695, Cl. 252-70.000.
Hawkes, Thaddeus A., to RCA Corporation. Carrier recovery loop for reception of quadraphase shift keyed signals. 4,538,120, Cl. 331-12.000.
Hawley, Gil R., to Phillips Petroleum Company. Polyolefin polymerization process and catalyst. 4,537,870, Cl. 502-111.000.
Hayami, Seinoshin: *See*—
Tajima, Hiroto; Kawakami, Hironori; Mashino, Zenichi; Hayami, Seinoshin; and Ohzeki, Osamu, 4,537,600, Cl. 44-51.000.
Hayashi, Kazuhiko: *See*—
Tanigawa, Kou; Masuda, Jiro; Nakamura, Kazumasa; and Hayashi, Kazuhiko, 4,537,272, Cl. 180-176.000.
Hayashi, Masakazu, to Kabushiki Kaisha Hayashi Racing. Vehicle wheel attaching device. 4,537,449, Cl. 301-9.0CN.
Hayashi, Nobuaki: *See*—
Nonogaki, Saburo; Hayashi, Nobuaki; and Tomita, Yoshifumi, 4,537,851, Cl. 430-144.000.
Hayashi, Toshihiko: *See*—
Matsuzaki, Yoshitomi; Hayashi, Toshihiko; and Kushibiki, Keizou, 4,537,159, Cl. 123-41.270.
Hayes, Garrett P. Water conserving flush valve for toilets. 4,536,900, Cl. 4-324.000.
Hazama, Junji: *See*—
Kakizaki, Yukio; Izawa, Hisao; and Hazama, Junji, 4,537,501, Cl. 355-76.000.

Hazelett, Robert W.; and Wood, John F. B., to Hazelett Strip-Casting Corporation. Method of and apparatus for steam preheating endless flexible casting belt. 4,537,243, Cl. 164-481.000.

Hazelett Strip-Casting Corporation: *See*—
Hazelett, Robert W.; and Wood, John F. B., 4,537,243, Cl. 164-481.000.

Healthcheck Corporation: *See*—
Fraden, Jacob, 4,538,074, Cl. 307-126.000.

Heath, Joseph R. System for aiding note transpositions for stringed instruments. 4,537,111, Cl. 84-473.000.

Heed, Björn. Welding method and equipment therefor. 4,538,048, Cl. 219-13[illegible].00R.

Heescher. Felix, to Rohm GmbH Chemische Fabrik. Reinforced construction panel. 4,536,997, Cl. 52-86.000.

Heffentrager, Joel L., to SMS Schloemann - Siemag, Inc. Rolling mill. 4,537,056, Cl. 72-238.000.

Heft, Josef: *See*—
Vertenten, Edward; and Heft, Josef, 4,537,455, Cl. 339-99.00R.

Hegedus, Bela: *See*—
Kreidl, Janos; Farkas nee Kirjak, Maria; Harsanyi, Kalman; Benke, Bela; Rado, Andras; Domany, Gyorgy; Hegedus, Bela; Csongor, Eva; Deutsch nee Juhasz, Ida; and Petho, Hajnalka, 4,537,900, Cl. 514-400.000.

Heiker, Fred R.; Stoltefuss, Jurgen; Franckowiak, Gerhard; Schramm, Matthias; Thomas, Gunter; and Gross, Rainer, to Bayer Aktiengesellschaft. 5-Nitro 1,4-dihydropyridines having a positive inotropic effect. 4,537,881, Cl. 514-25.000.

Heimerich, Henry R., to Boro Recycling Center, Inc. Apparatus for breaking glass bottles and crushing cans and like containers. 4,537,361, Cl. 241-81.000.

Heinemann, Frederick F.; and Gavin, Thomas O., to W. R. Grace & Co. Offset printing blanket. 4,537,129, Cl. 101-415.100.

Heinemann, Henning; Jasserand, Daniel; Milkowski, Wolfgang; Yavordios, Dimitri; and Zeugner, Horst, to Kali-Chemie Pharma GmbH. 1-Phenylindazol-3-one compounds. 4,537,975, Cl. 548-359.000.

Heinrich, Andrew L.; and Oljace, Richard L., to Caterpillar Tractor Co. Electrical switching apparatus. 4,538,036, Cl. 200-11.0EA.

Heinrich Greve GmbH: *See*—
Schmidt, Heinrich, 4,537,589, Cl. 493-373.000.

Heinsohn, George E.: *See*—
Rao, Velliyur N. M.; and Heinsohn, George E., 4,537,726, Cl. 260-453.00P.

Heiser, Richard: *See*—
Pollman, Frederic W.; Reynolds, David W.; and Heiser, Richard, 4,537,364, Cl. 242-86.510.

Heitmann, Uwe: *See*—
Lorenzen, Heinz-Christen; Heitmann, Uwe; Petersen, Kurt-Eckart; and Pinck, Peter, 4,537,206, Cl. 131-281.000.

Heitz, Walter: *See*—
Idel, Karsten; Ostlinning, Edgar; Koch, Wolfgang; Bottenbruch, Ludwig; and Heitz, Walter, 4,537,951, Cl. 528-388.000.

Held, Kurt. Metallic endless press band having an embossed surface for use in double band presses in the manufacture of laminates. 4,537,810, Cl. 428-156.000.

Hemmings, Kenneth L.: *See*—
Cox, William E.; and Hemmings, Kenneth L., 4,537,265, Cl. 175-19.000.

Henderson, Richard S.: *See*—
Tenhover, Michael A.; Henderson, Richard S.; and Grasselli, Robert K., 4,537,624, Cl. 75-0.50B.
Tenhover, Michael A.; Henderson, Richard S.; and Fox, Joseph R., 4,537,625, Cl. 75-0.50A.

Hendrickson, Larry L.: *See*—
Van Der Puy, Michael; Kolc, Jaroslav F.; Anello, Louis G.; Hendrickson, Larry L.; Rogic, Milorad M.; and Swerdloff, Michael D., 4,537,614, Cl. 71-28.000.

Hengstenberg, Eckart; and Disch, Heinrich, to Rich. Hengstenberg, Firma. Machine for filling jars with pieces of vegetables or fruits, in particular quartered pickles. 4,537,017, Cl. 53-515.000.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Greb, Wolfgang; Christophliemk, Peter; and Schroder, Christine, 4,537,771, Cl. 424-154.000.

Hennenfent, Douglas J.; Holmstrand, Allan L.; and Kracke, Alan G., to Magnetic Peripherals. Precision lapping system. 4,536,992, Cl. 51-109.00R.

Henning, Jerrold V., to Rockwell International Corporation. Microcomputer retriggerable interval counter. 4,538,235, Cl. 364-569.000.

Henriksson, Sven-Erik D.; Ahrel, Bo A.; Svensson, Claes G. S.; and Franzen, Torsten A. H., to MoDo-Chemetics AB. Process for producing and flash drying high yield mechanical cellulose pulp with steam and condensate recycle. 4,537,655, Cl. 162-23.000.

Henry, Charles H.; and Logan, Ralph A., to AT&T Bell Laboratories. Method of making a loss stabilized buried heterostructure laser. 4,536,940, Cl. 29-569.00L.

Hense, Thomas R.; and Rudolph, Ronald M., to Applied Power Inc. Datum point location apparatus. 4,536,962, Cl. 33-516.000.

Hercules Incorporated: *See*—
Keim, Gerald I., 4,537,657, Cl. 162-164.300.

Herd, Richard S.: *See*—
Horodysky, Andrew G.; and Herd, Richard S., 4,537,692, Cl. 252-49.600.

Hergenrother, William L., to Firestone Tire & Rubber Company, The. Composites and size coated glass fibers used therein. 4,537,917, Cl. 523-209.000.

Hermann C. Starck Berlin: *See*—
Albrecht, Wolf-Wigand; Hoppe, Axel; Papp, Uwe; and Wolf, Rudiger, 4,537,641, Cl. 148-11.50P.

Hermann, Hans D.; and Fabian, Klaus, to Hoechst Aktiengesellschaft. Thermoplastic molding compositions of polyvinylbutyral containing plasticizer. 4,537,830, Cl. 428-437.000.

Hermann Pfauter GmbH & Co.: *See*—
Becher, Friedrich; and Eggert, Walter, 4,537,537, Cl. 409-34.000.

Herold, Wolf-Dietrich; Grafwallner, Karl L.; and Keller, Michael, to ESPE Fabrik pharmazeutischer Praeparate GmbH. Apparatus for treating dental prosthetic parts with radiation. 4,538,070, Cl. 250-504.00R.

Herrington, Lawrence; and Avra, Raymond E., to MegaTape Corporation. High speed bidirectional magnetic tape transport with constant tension. 4,537,367, Cl. 242-198.000.

Herrmann, Anna: *See*—
Herrmann, Christian W., 4,537,559, Cl. 416-119.000.

Herrmann, Christian W., to Herrmann, Christian W.; and Herrmann, Anna. Venturi rotor apparatus for the generation of power. 4,537,559, Cl. 416-119.000.

Hershberger, Charles L.: *See*—
Boeck, LaVerne D.; Clem, Gladys M.; Hershberger, Charles L.; Anderson, Marie T.; and Michel, Karl H., 4,537,715, Cl. 260-112.50R.

Hess, Cecil, to Spectron Development Laboratories, Inc. Dual beam maximum intensity laser sizing system. 4,537,507, Cl. 356-336.000.

Hettinger, Peter: *See*—
Lange, Arno; Merger, Franz; Hettinger, Peter; and Adolphi, Heinrich, 4,537,901, Cl. 514-404.000.

Hewinson, Vincent K.: *See*—
Fleet, Charles R. W.; and Hewinson, Vincent K., 4,537,594, Cl. 8-94.10R.

HGM, Inc.: *See*—
Tanner, Howard M. C., 4,537,193, Cl. 128-303.100.

Hick & Co. GmbH: *See*—
Hick, Werner, 4,537,749, Cl. 422-304.000.

Hick, Werner, to Hick & Co. GmbH. Process and device for sterilizing tub-shaped containers. 4,537,749, Cl. 422-304.000.

Hickam, William M.: *See*—
Lee, Pang K.; and Hickam, William M., 4,537,661, Cl. 204-1.00T.

Hiestand, Karl, to SMW Schneider & Weisshaupt GmbH. Arrangement for supplying a chuck with pressure fluid. 4,537,410, Cl. 279-4.000.

Higgins, George D.: *See*—
McCain, William B.; and Higgins, George D., 4,537,342, Cl. 227-78.000.

Hihn, Gerhard: *See*—
Stoll, Kurt; and Hihn, Gerhard, 4,537,113, Cl. 92-24.000.

Hijiya, Hiromi: *See*—
Miyake, Toshio; and Hijiya, Hiromi, 4,537,763, Cl. 424-49.000.

Hill, Harold I.; Norem, Stanley D.; and Targowski, Roger, to Perkin-Elmer Corporation, The. Assembly for positioning a thermogravimetric furnace. 4,537,572, Cl. 432-55.000.

Hill, Walter F. Multi-season ski sled. 4,537,412, Cl. 280-7.120.

Hilton-Davis Chemical Co., The: *See*—
Rebhahn, Robert W. J.; Kassner, James E.; and Werner, Raymond E., 4,537,971, Cl. 546-320.000.

Hinke, Walter; and Kaiser, Harry, to Robert Bosch GmbH. High-output magnetic field transducer. 4,538,082, Cl. 310-152.000.

Hinrichs, Walter; Hammer, Friedrich; and Lange, Ludwig, to Degussa Aktiengesellschaft. Process for the continuous production of solid alkali metal strands. 4,536,938, Cl. 29-527.500.

Hirano, Makoto: *See*—
Honda, Shoichi; Nakano, Yoshikatsu; Hirano, Makoto; and Matsuura, Masaaki, 4,537,165, Cl. 123-90.160.

Hirasuna, Alan R.; and Veal, Gordon R., to L'Garde, Inc. Hostile environment joint seal and method for installation. 4,537,406, Cl. 277-1.000.

Hirata, Michitoshi: *See*—
Yamaguchi, Tadashi; Ono, Takayuki; Hirata, Michitoshi; and Yokoyama, Toshihiko, 4,537,645, Cl. 149-3.000.

Hirnbock, Rudolf; and Haudum, Adolf, to Kastle Gesellschaft m.b.H. Ski, particularly a cross country ski. 4,537,417, Cl. 280-602.000.

Hirokazu, Aoki: *See*—
Toyooka, Takashi; Hirokazu, Aoki; Sugie, Mamoru; and Sugita, Yutaka, 4,538,242, Cl. 365-8.000.

Hirose, Kikuji: *See*—
Kitayama, Minoru; Nakamura, Motoharu; Hirose, Kikuji; and Tanida, Masashi, 4,537,792, Cl. 427-13.000.

Hirose Manufacturing Co., Ltd.,: *See*—
Hirose, Tokuzo, 4,537,142, Cl. 112-231.000.

Hirose, Tokuzo, to Hirose Manufacturing Co., Ltd., Shuttle stopper for lock stitch sewing machine. 4,537,142, Cl. 112-231.000.

Hiseman, Robert Allen: *See*—
Ross, Mark A., 4,536,959, Cl. 30-161.000.

Hitachi, Ltd.: *See*—
Ashida, Akira, 4,538,119, Cl. 331-1.00A.
Gotoh, Yoshitomo; and Iwamoto, Kiyofumi, 4,538,039, Cl. 200-144.00B.
Hattori, Osamu; and Tamura, Shingo, 4,538,254, Cl. 369-43.000.
Kajiwara, Toshiyuki; and Kojima, Tatsuji, 4,537,057, Cl. 72-243.000.
Kato, Akira; Kamo, Tomoichi; Uno, Shigeo; Kawagoshi, Hiroshi; Yamashita, Hisao; and Matsuda, Shinpei, 4,537,873, Cl. 502-242.000.
Kunimi, Nobuo; Shimizu, Koichi; and Suzuki, Toshiro, 4,538,114, Cl. 330-253.000.

Mitamura, Sachio; and Kuroume, Hirotsugu, 4,537,538, Cl. 409-217.000.
Nakajima, Hirohito; Haji, Katsumi; Shibata, Yoji; and Kosuge, Wataru, 4,538,176, Cl. 358-86.000.
Nonogaki, Saburo; Hayashi, Nobuaki; and Tomita, Yoshifumi, 4,537,851, Cl. 430-144.000.
Shishikura, Toshikazu; Konuma, Hiroshi; Nakamura, Hidenori; and Kobayashi, Yukio, 4,537,843, Cl. 429-197.000.
Takahasi, Kenichiro, 4,537,510, Cl. 356-435.000.
Tsukui, Tsutomu; Shimizu, Toshio; Doi, Ryota; and Tsutsumi, Yasuyuki, 4,537,840, Cl. 429-33.000.

Hitachi Zosen Corporation: *See*—
Nakano, Teruo; Ohtani, Hideji; Miyawaki, Kunio; and Mogi, Shigeo, 4,538,047, Cl. 219-125.100.

Hiyama, Torao; and Nishizawa, Kazuo, to Alps Electric Co., Ltd. Impedance converting transformer formed of conductors extending through a magnetic housing. 4,538,132, Cl. 336-221.000.

Hoberg, Clarence P.: *See*—
Little, Michael J.; Brown, Roger H.; Efron, Uzi; and Hoberg, Clarence P., 4,537,827, Cl. 428-409.000.

Hochschild, James R., to Texas Instruments Incorporated. Integrated circuit PSK modem phase locked loop. 4,538,282, Cl. 375-9.000.

Hock, Allan G.: *See*—
Cooke, Theodore M.; Lin, Robert A.; Whitfield, Richard G.; and Hock, Allan G., 4,537,631, Cl. 106-22.000.

Hoechst Aktiengesellschaft: *See*—
Hermann, Hans D.; and Fabian, Klaus, 4,537,830, Cl. 428-437.000.
Rottgen, Karl; Stendel, Joachim; and Diskowski, Herbert, 4,537,756, Cl. 423-323.000.

Hoechst-Roussel Pharmaceuticals Inc.: *See*—
Ong, Helen H.; and Profitt, James A., 4,537,976, Cl. 549-54.000.

Hoff, Dieter; and Ramsch, Klaus-Dieter, to Bayer Aktiengesellschaft. Liquid formulations of dihydropyridines. 4,537,898, Cl. 514-356.000.

Hoffman, Kevin R.: *See*—
Nath, Prem; Hoffman, Kevin R.; and Laarman, Timothy D., 4,537,795, Cl. 427-39.000.

Hoffmann-La Roche Inc.: *See*—
Liu, Chao-Min; and Westley, John, 4,537,956, Cl. 536-1.100.
Wei, Chung-Chen; and Weigele, Manfred, 4,537,969, Cl. 546-210.000.

Hogen, Delman R., to Lemna Corporation, The. Aquatic biomass containment barrier and method of assembling same. 4,536,988, Cl. 47-1.500.

Hogge, Charles R., Jr., to Rockwell International Corporation. Adaptive equalizer suitable for use with fiber optics. 4,538,283, Cl. 375-14.000.

Hoglund, Nils O., Jr., to Hoglund Tri-Ordinate Corporation. Worktable with lateral and rotational movement. 4,536,991, Cl. 51-101.00R.

Hoglund Tri-Ordinate Corporation: *See*—
Hoglund, Nils O., Jr., 4,536,991, Cl. 51-101.00R.

Hok, Bertil: *See*—
Dubon, Chantal; Hok, Bertil; and Ovren, Christer, 4,537,467, Cl. 350-96.200.

Holcomb, David A., to F & H Holdings, Inc. Device for pressing garlic and the like. 4,537,123, Cl. 100-125.000.

Holden, Scott C., to Varian Associates, Inc. Method for optimum conductive heat transfer with a thin flexible workpiece. 4,537,244, Cl. 165-1.000.

Hollaar, Leendert J.; Zoetman, Herman; and Verbeek, Robert J. M., to U.S. Philips Corporation. High-stability clock signal regenerator with a stable fixed frequency backup clock generator. 4,538,110, Cl. 328-63.000.

Hollander, Edward F., Jr., to Glass, John P. Rupturable packages. 4,537,308, Cl. 206-484.000.

Hollingshead, William S.: *See*—
Colvin, Howard A.; Muse, Joel, Jr.; and Hollingshead, William S., 4,538,002, Cl. 568-650.000.

Hollingsworth, John D. Metallic card clothing and method and apparatus for making same. 4,537,096, Cl. 76-1.000.

Hollingsworth (U.K.) Limited: *See*—
Parker, Alan, 4,537,021, Cl. 57-401.000.

Holmes, John G.: *See*—
Resnick, Brian J.; Messina, Elena R.; Bhatia, Madhukar; and Holmes, John G., 4,538,233, Cl. 364-513.000.

Holmes, Paul A., to Imperial Chemical Industries PLC. Process for orienting partially crystallized 3-hydroxybutyrate polymers. 4,537,738, Cl. 264-210.500.

Holmstrand, Allan L.: *See*—
Hennenfent, Douglas J.; Holmstrand, Allan L.; and Kracke, Alan G., 4,536,992, Cl. 51-109.00R.

Holopainen, Weikko R. Branch cutter mounted on front loader bucket. 4,536,976, Cl. 37-117.500.

Holsinger, Ronald F.: *See*—
Gluckstern, Robert L.; Holsinger, Ronald F.; and Lown, Robert R., 4,538,130, Cl. 335-306.000.

Holtschmidt, Ulrich: *See*—
Gruning, Burghard; Holtschmidt, Ulrich; and Koerner, Gotz, 4,537,595, Cl. 8-115.600.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Ajiki, Yoshio; and Matsuura, Masaaki, 4,537,164, Cl. 123-90.160.
Funabashi, Katsunori, 4,537,273, Cl. 180-229.000.
Honda, Shoichi; Nakano, Yoshikatsu; Hirano, Makoto; and Matsuura, Masaaki, 4,537,165, Cl. 123-90.160.
Kadowaki, Satoshi; and Ikeda, Yuzi, 4,538,044, Cl. 219-80.000.
Kimura, Kenji; and Nishikawa, Masayasu, 4,537,166, Cl. 123-90.360.

Honda, Masaaki; Itakura, Fumitada; and Kitawaki, Nobuhiko, to Nippon Telegraph & Telephone Public Corporation. Adaptive predictive processing system. 4,538,234, Cl. 364-513.500.

Honda, Mitsuo: *See*—
Tominaga, Jiro; Yada, Hiroshi; and Honda, Mitsuo, 4,537,644, Cl. 148-36.000.

Honda, Shoichi; Nakano, Yoshikatsu; Hirano, Makoto; and Matsuura, Masaaki, to Honda Giken Kogyo Kabushiki Kaisha. Valve actuating mechanism having stopping function for internal combustion engines. 4,537,165, Cl. 123-90.160.

Honeywell Inc.: *See*—
Lasser, George A., 4,538,273, Cl. 371-62.000.
Nicklas, Roger W.; Reynolds, John E.; and Schiestl, Randall L., 4,536,928, Cl. 29-1.200.

Honeywell Information Systems Inc.: *See*—
Circello, Joseph C., 4,538,237, Cl. 364-746.000.
Circello, Joseph C.; and Guenthner, Russell W., 4,538,238, Cl. 364-746.000.

Honeywell Ltd.: *See*—
Watson, Francis M., 4,538,218, Cl. 362-802.000.

Hong, Won P., to Suk, Suh Kyung. Portland cement, process for preparing same, and compositions containing same. 4,537,633, Cl. 106-96.000.

Hooper, Lindsay A., to Repco Ltd. Energy absorber for exercising machines. 4,537,396, Cl. 272-130.000.

Hooper, Robert L.: *See*—
Balbes, Michael S.; Day, Charles E.; Hooper, Robert L.; and Lin, Hank S., 4,538,175, Cl. 358-86.000.

Hoppe, Axel: *See*—
Albrecht, Wolf-Wigand; Hoppe, Axel; Papp, Uwe; and Wolf, Rudiger, 4,537,641, Cl. 148-11.50P.

Hoppe, Wolfgang: *See*—
Beckmann, Friedrich K.; Hoppe, Wolfgang; and Meyer, Wolfgang, 4,538,125, Cl. 333-248.000.

Hori, Kiyoshi, to NEC Corporation. Buffer control system. 4,538,226, Cl. 364-200.000.

Horikawa, Takeshi: *See*—
Kojima, Hidetaka; Horikawa, Takeshi; and Kagotani, Masahiro, 4,537,997, Cl. 568-454.000.

Horiuchi, Toshiaki: *See*—
Yamanaka, Takashi; Takeya, Yasushi; Yorita, Mitsumasa; Horiuchi, Toshiaki; Inagaki, Kouichi; Naya, Eizo; Demizu, Michinosuke; and Okumura, Mitsuhiro, 4,537,743, Cl. 419-38.000.

Hormadaly, Jacob, to Du Pont de Nemours, E. I., and Company. Borosilicate glass compositions. 4,537,703, Cl. 252-518.000.

Horn, Uriah: *See*—
Francel, Josef; Horn, Uriah; and Stewart, Daniel R., 4,537,862, Cl. 501-14.000.

Horodniceanu, Florian; and Le Fur, Raphael, to Institut Pasteur. Process for growing cell cultures of diploid cells on cell supports. 4,537,790, Cl. 427-2.000.

Horodysky, Andrew G.; and Herd, Richard S., to Mobil Oil Corporation. Etherdiamine borates and lubricants containing same. 4,537,692, Cl. 252-49.600.

Horodysky, Andrew G., to Mobil Oil Corporation. Diamine carboxylates and lubricant compositions containing same. 4,537,694, Cl. 252-51.50A.

Horton, Derek; and Priebe, Waldemar, to Ohio State University. 4-Demethoxy-3'-desamino-2'-halo-anthracycline and pharmaceutical composition containing same. 4,537,882, Cl. 514-34.000.

Horton, Jerry L., to Small Waters, Inc. Propelled water craft. 4,537,144, Cl. 114-61.000.

Horvath, Istvan; Lang, Tibor; Pongo, Laszlo ; Reiter, Jozsef; Somorai, Tamas; Szilagyi, Geza; and Toldy, Lajos, to BIOGAL Gyogyszergyar. Antiviral acylated 1,2,4-triazole derivatives. 4,537,899, Cl. 514-384.000.

Horvath nee Gaal, Maria: *See*—
Deak, Gyula; Zara nee Kaczian, Erzsebet; Gyorgy, Lajos; Fekete, Marton; Doda, Margit; Seregi, Andras; Kanyicska, Bela; Toth nee Pecsi, Erzsebet; Horvath nee Gaal, Maria; Manyai, Sandor; Gorgenyi, Frigyes; and Vaszovics nee Reichmann, Gyorgyi, 4,537,895, Cl. 514-307.000.

House Food Industrial Company Ltd: *See*—
Sugisawa, Ko; Matsumura, Yasushi; Taga, Kazumitsu; Sengoku, Kouji; and Nagatome, Yoshiaki, 4,537,789, Cl. 426-634.000.

Howatt, John R.: *See*—
Sharp, Harper E.; Spiegel, Leo; Masters, Richard M.; Frey, Elmer J.; Howatt, John R.; and Walker, Gary E., 4,537,067, Cl. 73-151.000.

Howe, Dennis G.: *See*—
Gupta, Mool C.; Wrobel, Joseph J.; and Howe, Dennis G., 4,538,159, Cl. 346-135.100.

Hoya Lens Corporation: *See*—
Akaba, Hayao; Yamada, Takeshi; and Jinbo, Masahiro, 4,537,480, Cl. 351-235.000.

Hoyland, Trevor B., to Thurne Engineering Co. Ltd. Bag tying machine. 4,537,005, Cl. 53-131.000.

Hoyle, James E. Lap desk. 4,537,646, Cl. 156-212.000.

Hruda, Robert M., to Westinghouse Electric Corp. Method of electrically shorting an electrolytic cell. 4,537,662, Cl. 204-1.00R.

Hu, Chenming: *See*—
Wang, Samuel T.; Hu, Chenming; and Shum, Ying, 4,538,246, Cl. 365-226.000.

Huber, Reinhold; and Koster, Waldemar, to Kober AG. Elastomeric sectional strip for expansion joints. 4,537,003, Cl. 52-573.000.

Huber, Werner: *See*—
Gsponer, Arnold; Huber, Werner; and Petrovic, Milan, 4,537,302, Cl. 198-626.000.
Hubert, Olivier: *See*—
Delle-Vedove, Daniel; Lallemand, Yves; and Hubert, Olivier, 4,537,201, Cl. 128-697.000.
Hughes Aircraft Company: *See*—
Grinberg, Jan; and Little, Michael J., 4,537,471, Cl. 350-333.000.
Lau, Kreisler S. Y., 4,537,974, Cl. 548-328.000.
Little, Michael J.; Brown, Roger H.; Efron, Uzi; and Hoberg, Clarence P., 4,537,827, Cl. 428-409.000.
Hughes, James S.: *See*—
Ewing, Robert L.; Hughes, James S.; and Bruggeman, Bruce, 4,538,217, Cl. 362-375.000.
Hulka, Jaroslav F. Disposable fetal oxygen monitor. 4,537,197, Cl. 128-633.000.
Humes, Arnold F. Ladder assembly. 4,537,283, Cl. 182-127.000.
Humke, Albert L., to Deere & Company. Exhaust port. 4,537,028, Cl. 60-272.000.
Humphry, Donald E.: *See*—
Carle, Glenn C.; Kojiro, Daniel R.; and Humphry, Donald E., 4,538,066, Cl. 250-374.000.
Hunt, Peter: *See*—
Sharpe, Raymond; Griffiths, Trevor J.; and Hunt, Peter, 4,537,578, Cl. 464-31.000.
Hunter Douglas Inc.: *See*—
Anderson, Richard N., 4,537,004, Cl. 52-788.000.
Hunter, George L. K.; Dennison, Daniel B.; and Stephens, Charles E., to Coca-Cola Company, The. Hydration drying process. 4,537,637, Cl. 127-60.000.
Hupfer, Leopold: *See*—
Goetz, Norbert; Laas, Harald; Tavs, Peter; Hupfer, Leopold; and Baer, Karl, 4,538,009, Cl. 568-799.000.
Huret, Noel; and Meunier, Jean, to Cegedur Societe de Transformation de l'Aluminium Pechiney. Inserts for pistons of diesel engines of aluminum-silicon alloys having an improved thermal resistance and machinability. 4,537,161, Cl. 123-41.710.
Huret, Noel: *See*—
Eudier, Michel; Huret, Noel; and Meunier, Jean, 4,537,167, Cl. 123-193.00C.
Huschelrath, Gerhard; and Lein, Wilfried, to NUKEM GmbH. Testing arrangement for ferromagnetic bodies including magnetic field detectors extending between two pairs of poles of magnetic field generators spaced longitudinally along the body. 4,538,108, Cl. 324-232.000.
Hutchins, Clinton E.: *See*—
Nguyen, Trung H.; and Hutchins, Clinton E., 4,537,665, Cl. 204-29.000.
Hwang, Kyu S.; and Koestler, Dennis J., to Duo-Matic/Olsen Inc. High efficiency furnace. 4,537,178, Cl. 126-110.00R.
Hycner, Stanley H.: *See*—
Fadner, Thomas A.; and Hycner, Stanley H., 4,537,127, Cl. 101-141.000.
Hydril Company: *See*—
Landriault, L. Steven, 4,537,428, Cl. 285-333.000.
Landriault, L. Steven, 4,537,429, Cl. 285-334.000.
Hydromagnetics, Inc.: *See*—
Shalhoob, William N.; and Kaspaul, Alfred F., 4,537,181, Cl. 128-1.300.
Hyodo, Motoi: *See*—
Maruyama, Katsuaki; Oishi, Yaichi; Noda, Norio; Terada, Takami; and Hyodo, Motoi, 4,537,444, Cl. 297-284.000.
Ibiden Kabushiki Kaisha: *See*—
Enomoto, Ryo; and Tsukada, Kiyotaka, 4,537,735, Cl. 264-63.000.
Ibrahim, Fayez F., to Tyler Refrigeration Corporation. Automated energy conserving cover for refrigerated cabinet access openings. 4,537,040, Cl. 62-186.000.
Ichikawa, Kozo: *See*—
Ando, Toshihiko; Ito, Norifumi; Matsubara, Tetsuyuki; Ichikawa, Kozo; Fukawa, Susumu; and Maeda, Tetsuo, 4,537,954, Cl. 528-481.000.
Ide, Hiroshi, to Mitsubishi Chemical Industries Limited. Photopolymerizable photosensitive composition. 4,537,855, Cl. 430-285.000.
Idel, Karsten; Ostlinning, Edgar; Koch, Wolfgang; Bottenbruch, Ludwig; and Heitz, Walter, to Bayer Aktiengesellschaft. Process for the production of optionally branched polyarylene sulfides. 4,537,951, Cl. 528-388.000.
Identix Incorporated: *See*—
Fowler, Randall C.; Ruby, Kenneth; and Sartor, Thomas F., Jr., 4,537,484, Cl. 354-62.000.
Iizuka, Yo: *See*—
Kawakami, Yukichika; Shiiki, Zenya; and Iizuka, Yo, 4,537,953, Cl. 528-388.000.
Ikeda, Yuzi: *See*—
Kadowaki, Satoshi; and Ikeda, Yuzi, 4,538,044, Cl. 219-80.000.
Ikuta, Hiroshi: *See*—
Suzuki, Akihiro; Souda, Keiichi; Kuno, Masao; and Ikuta, Hiroshi, 4,538,191, Cl. 360-88.000.
Illerhaus, Roland; and Jurgens, Rainer, to Christensen, Inc. Method and apparatus for manufacturing cutting elements particularly for deep drilling. 4,537,097, Cl. 76-108.00A.
Imai, Akio: *See*—
Takao, Hiroyoshi; Yamamoto, Keisaku; Imai, Akio; Yoshida, Nobuyuki; Furukawa, Hiroshi; Saito, Yuichi; and Okumura, Akio, 4,537,936, Cl. 525-236.000.
Imai, Takafumi; and Kobayashi, Fumihiko, to Toshiba Silicone Co., Ltd. Room temperature curable polyorganosiloxane composition. 4,537,944, Cl. 528-18.000.
Imanishi, Kazuo; Hashimoto, Masaru; and Mori, Makoto, to Tokyo Shibaura Denki Kabushiki Kaisha. Protection circuit for an output transistor. 4,538,198, Cl. 361-86.000.
Imasco-CDC Research Foundation: *See*—
Saringer, John H., 4,537,083, Cl. 74-89.150.
Immler, Josef; and van der Sel, Cornelis, to Siemens Aktiengesellschaft. Optical wand for reading OCR characters and bar code marks. 4,538,072, Cl. 250-568.000.
Imperial Chemical Industries Limited: *See*—
Greenshields, James N., 4,537,980, Cl. 549-370.000.
Imperial Chemical Industries, PLC: *See*—
Brereton, Colin, 4,537,672, Cl. 204-253.000.
Casci, John L.; Lowe, Barrie M.; and Whittam, Thomas V., 4,537,754, Cl. 423-277.000.
Holmes, Paul A., 4,537,738, Cl. 264-210.500.
Saunders, Peter J., 4,537,131, Cl. 102-217.000.
In-Situ, Inc.: *See*—
Silver, Howard F.; and Miller, Ronald L., 4,537,675, Cl. 208-8.0LE.
Inagaki, Kouichi: *See*—
Yamanaka, Takashi; Takeya, Yasushi; Yorita, Mitsumasa; Horiuchi, Toshiaki; Inagaki, Kouichi; Naya, Eizo; Demizu, Michinosuke; and Okumura, Mitsuhiro, 4,537,743, Cl. 419-38.000.
Inagaki, Satoru: *See*—
Asanuma, Tetsu; and Inagaki, Satoru, 4,538,052, Cl. 219-469.000.
INCO Limited: *See*—
Borbely, Gyula J.; Devuyst, Eric A.; Ettel, Victor A.; Mosoiu, Marcel A.; and Schitka, Konstantin J., 4,537,686, Cl. 210-713.000.
Infilco Degremont Inc.: *See*—
Piper, Louis H., 4,537,687, Cl. 210-793.000.
Ingenior Thor Furuholmen A/S: *See*—
Bjor, Hakon E., 4,537,263, Cl. 173-1.000.
Inglett & Company, Inc.: *See*—
Inglett, Wilfred L., Jr.; Ashley, Walter M., Jr.; and Manfredonia, Abe J., 4,537,015, Cl. 53-386.000.
Inglett, Wilfred L., Jr.; Ashley, Walter M., Jr.; and Manfredonia, Abe J., to Inglett & Company, Inc. Bag placer for a packaging machine. 4,537,015, Cl. 53-386.000.
Innovative Surgical Products, Inc.: *See*—
Talcott, Thomas D., 4,537,943, Cl. 528-15.000.
Inoi, Takeshi: *See*—
Ogawa, Tetsuya; Saitoh, Shinichi; Inoi, Takeshi; Kato, Masaji; and Obara, Heitaro, 4,537,999, Cl. 568-584.000.
Inomata, Koichiro; and Murata, Shinichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Temperature sensitive amorphous magnetic alloy. 4,537,517, Cl. 374-21.000.
Inoue, Michihiro: *See*—
Sadamatsu, Hideaki; Inoue, Michihiro; Kanda, Akihiro; and Matsuzawa, Akira, 4,536,950, Cl. 29-578.000.
Inoue, Yoichi: *See*—
Asari, Akira; Tsuzuki, Hidehiro; Inoue, Yoichi; and Tabuchi, Takahisa, 4,537,569, Cl. 425-405.00H.
Inoue, Yoshio: *See*—
Tanaka, Masaho; Shishido, Tomio; Fukuhara, Tetsukazu; Yao, Yugo; Kobayashi, Kunihilo; and Inoue, Yoshio, 4,538,042, Cl. 219-58.000.
Institut Pasteur: *See*—
Horodniceanu, Florian; and Le Fur, Raphael, 4,537,790, Cl. 427-2.000.
Instituto Mexicano de Investigaciones Siderurgicas: *See*—
Lazcano-Navarro, Arturo; and Alcantara, Miguel A., 4,537,629, Cl. 75-130.00R.
Intel Corporation: *See*—
Bohr, Mark T.; Yu, Ken K.; Yau, Leo D.; and Garg, Shyam G., 4,536,947, Cl. 29-576.00C.
International Business Machines Corporation: *See*—
Aviram, Ari, 4,538,252, Cl. 369-13.000.
Ballatore, Daniel; Bonnet, Yves A.; Ferry, Michel F.; and Jacquart, Christian A., 4,538,032, Cl. 179-170.00D.
Bracco, Al M.; Edenfeld, Arthur R.; and Kotecha, Harish N., 4,536,944, Cl. 29-571.000.
Carter, John L.; Markowsky, George; and Wegman, Mark N., 4,538,240, Cl. 364-754.000.
Chang, Chin-An; Chang, Leroy L.; Esaki, Leo; and Mendez, Emilio E., 4,538,165, Cl. 357-22.000.
Cuomo, Jerome J.; Harper, James M. E.; and Waters, Gary A., 4,538,067, Cl. 250-396.00R.
Day, Michael N.; and Miller, Claude D., 4,538,265, Cl. 371-12.000.
Moore, Brian B., 4,538,259, Cl. 370-60.000.
International Computers Limited: *See*—
Gudgeon, Bryan, 4,536,955, Cl. 29-840.000.
International Flavors & Fragrances Inc.: *See*—
Sprecker, Mark A.; Wiegers, Wilhelmus J.; Belko, Robert P.; and Boden, Richard M., 4,537,704, Cl. 252-522.00R.
International Paper Company: *See*—
Thomas, Gilles R., 4,537,344, Cl. 229-34.00R.
International Remote Imaging Systems, Inc.: *See*—
DeForest, Sherman E., 4,538,299, Cl. 382-21.000.
International Standard Electric Corporation: *See*—
Szabo, Laszlo; and Schunemann, Klaus, 4,538,122, Cl. 331-96.000.
Wuyts, Oscar; Ruelens, Remy F.; and Van Camp, Lucien J. M., 4,538,201, Cl. 361-124.000.
International Telephone and Telegraph Corporation: *See*—
Briscoe, Milton R., 4,538,269, Cl. 371-22.000.

Morris, David; and Schwarz, Albrecht, 4,538,219, Cl. 363-26.000.
VonGrunberg, Hubertus; Rowell, Jonathan M.; and Corey, Frederick C., 4,537,289, Cl. 188-97.400.

Intini, Thomas D. Child-resistant tamper-evident package. 4,537,312, Cl. 206-531.000.

Inui, Tetsuji: *See—*
Hatakeyama, Kenichi; and Inui, Tetsuji, 4,538,151, Cl. 343-18.00A.

Ioptex Inc.: *See—*
Bittner, Timothy, 4,536,895, Cl. 623-6.000.
Bittner, Timothy, 4,536,896, Cl. 623-6.000.

Iota Engineering Co.: *See—*
Perper, Lloyd J., 4,538,094, Cl. 315-221.000.

Irie, Namio: *See—*
Ito, Hideo; Kuroki, Junsuke; and Irie, Namio, 4,537,420, Cl. 280-661.000.

Irving, Edward, to Ciba-Geigy Corporation. Diaryliodosyl salts. 4,537,725, Cl. 556-138.000.

Isacoff, Eric G.; and Neely, James W., to Rohm and Haas Company. Trihalomethane precursor removal using ion exchange emulsions. 4,537,683, Cl. 210-667.000.

Ishibashi, Masaya; and Tada, Atuki, to Pioneer Electronic Corporation. Disc playing system with continuous playing function. 4,538,253, Cl. 369-34.000.

Ishida, Hideaki: *See—*
Sakurai, Keiichi; Ishida, Hideaki; and Hanzawa, Kohtaro, 4,537,110, Cl. 84-1.260.

Ishida, Hiroshi: *See—*
Chono, Masazumi; and Ishida, Hiroshi, 4,537,757, Cl. 423-328.000.

Ishihama, Masao: *See—*
Kimura, Akira; Ishihama, Masao; Abe, Toshiro; Shimada, Kiyoshi; and Matsui, Shinichi, 4,537,275, Cl. 180-300.000.

Ishihara, Hideo: *See—*
Yamamura, Kazuomi; Ishihara, Hideo; Iwamoto, Yoshinao; Sakaguchi, Hifumi; Morita, Masao; and Izawa, Toshio, 4,537,530, Cl. 405-160.000.

Ishikawa, Norio: *See—*
Taniguchi, Nobuyuki; Ishikawa, Norio; and Egawa, Takeshi, 4,537,487, Cl. 354-400.000.

Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See—*
Tsuchida, Yutaka; and Fukai, Toshiyuki, 4,537,240, Cl. 164-430.000.

Ishimura, Koichi: *See—*
Niino, Shuhei; Ishimura, Koichi; Okamoto, Ken; and Ohba, Koichi, 4,537,051, Cl. 72-12.000.

Iskra, Michael J.: *See—*
Pieniak, Heinz A.; and Iskra, Michael J., 4,537,590, Cl. 604-379.000.

Itakura, Fumitada: *See—*
Honda, Masaaki; Itakura, Fumitada; and Kitawaki, Nobuhiko, 4,538,234, Cl. 364-513.500.

Itek Corporation: *See—*
Lein, Juergen G.; and Robbins, Daniel H., 4,537,492, Cl. 355-3.0FU.

Ito, Akihiko: *See—*
Takayama, Yoshihisa; Gotoh, Kunihiko; Ito, Akihiko; Yamamura, Takeshi; and Fujita, Kazuyoshi, 4,536,949, Cl. 29-578.000.

Ito, Hideo; Kuroki, Junsuke; and Irie, Namio, to Nissan Motor Company, Limited. Swing-arm-type suspension with a lateral rod for an automotive vehicle. 4,537,420, Cl. 280-661.000.

Ito, Katsumi; and Fuziwara, Osami, to Kubota, Ltd. Running vehicle. 4,537,271, Cl. 180-131.000.

Ito, Norifumi: *See—*
Ando, Toshihiko; Ito, Norifumi; Matsubara, Tetsuyuki; Ichikawa, Kozo; Fukawa, Susumu; and Maeda, Tetsuo, 4,537,954, Cl. 528-481.000.

Ito, Tsukasa, to Clarion Co., Ltd. Light-emitting diode displayer. 4,538,143, Cl. 340-719.000.

Itoh, Toshiyasu; and Mori, Takaaki, to Toyoda Gosei Co., Ltd. Resin article having a ceramics coating layer. 4,537,814, Cl. 428-217.000.

Itoh, Yoshimasa; and Asakawa, Shiroh, to Matsushita Electric Industrial Co., Ltd. Oxygen enriched gas supply arrangement for combustion. 4,537,606, Cl. 55-158.000.

ITR International Timelimited: *See—*
Rudland, Peter E., 4,538,059, Cl. 235-468.000.

ITT Industries, Inc.: *See—*
Stoka, Roberto, 4,537,288, Cl. 188-71.800.
Thiel, Rudolf; Weisbrod, Helmut; and Braehler, Hermann, 4,537,291, Cl. 188-73.380.

ITW Limited: *See—*
Meeks, Alan M. G., 4,537,432, Cl. 292-318.000.

Itzkovitch, Irwin J.: *See—*
Reed, Gordon A. D.; and Itzkovitch, Irwin J., 4,537,761, Cl. 423-644.000.

Iwagami, Hisao: *See—*
Kato, Toshihisa; Iwagami, Hisao; and Yasuda, Naohiko, 4,537,719, Cl. 260-239.00A.

Iwagami, Kenji; and Yamamoto, Hachizou, to Sharp Kabushiki Kaisha. Cash accounting system. 4,538,057, Cl. 235-379.000.

Iwamatsu, Noboru: *See—*
Kawada, Shigeki; Amemiya, Yoichi; Sogabe, Masatoyo; and Iwamatsu, Noboru, 4,538,084, Cl. 310-217.000.

Iwamatsu, Seiichi, to Kabushiki Kaisha Suwa Seikosha. X-ray source. 4,538,291, Cl. 378-119.000.

Iwamoto, Junjiro: *See—*
Asawa, Tatsuro; Sajima, Yasuo; and Iwamoto, Junjiro, 4,537,673, Cl. 204-253.000.

Iwamoto, Kiyofumi: *See—*
Gotoh, Yoshitomo; and Iwamoto, Kiyofumi, 4,538,039, Cl. 200-144.00B.

Iwamoto, Yoshinao: *See—*
Yamamura, Kazuomi; Ishihara, Hideo; Iwamoto, Yoshinao; Sakaguchi, Hifumi; Morita, Masao; and Izawa, Toshio, 4,537,530, Cl. 405-160.000.

Iwasaki, Masayoshi: *See—*
Ooshiro, Takehiko; Iwasaki, Masayoshi; Sahara, Kousuke; Suzuki, Norio; Utsumi, Hitoshi; Miyake, Kazuo; and Aburatani, Kenji, 4,537,073, Cl. 73-602.000.

Iwase, Seiichiro; and Komori, Shinichi, to Sony Corporation. Analog to digital converting system for composite video signal. 4,538,172, Cl. 358-13.000.

Izaki, Katsura, to Mitsubishi Denki Kabushiki Kaisha. Air conditioning apparatus for cars. 4,537,114, Cl. 98-2.060.

Izawa, Hisao: *See—*
Kakizaki, Yukio; Izawa, Hisao; and Hazama, Junji, 4,537,501, Cl. 355-76.000.

Izawa, Kouji: *See—*
Kanno, Masayuki; Tezuka, Hisao; Izawa, Kouji; and Kamiyama, Tadanobu, 4,538,183, Cl. 358-280.000.

Izawa, Toshio: *See—*
Yamamura, Kazuomi; Ishihara, Hideo; Iwamoto, Yoshinao; Sakaguchi, Hifumi; Morita, Masao; and Izawa, Toshio, 4,537,530, Cl. 405-160.000.

Izumi, Akio: *See—*
Shiino, Kouji; Hashimoto, Nobuo; Wada, Shozo; Nakamura, Keijiro; Izumi, Akio; Sato, Toshio; and Matsui, Takashi, 4,537,648, Cl. 156-351.000.

J. I. Case Company: *See—*
Moneta, Casimir, 4,537,089, Cl. 74-493.000.
Parquet, Donald J., 4,537,274, Cl. 180-270.000.

Jackson, Graham; and Surawy, Ryszard, to British Aerospace Public Limited Company. Position control. 4,537,075, Cl. 73-634.000.

Jackson, Melvin R.: *See—*
Siemers, Paul A.; Kopp, Robert W.; and Jackson, Melvin R., 4,537,742, Cl. 419-8.000.

Jacmorr Manufacturing Limited: *See—*
Baxter, Alan R., 4,537,450, Cl. 308-3.800.

Jacobs, Peter: *See—*
Reissenweber, Gernot; Kersten, Siegfried; Ditter, Walter; and Jacobs, Peter, 4,537,986, Cl. 560-132.000.

Jacobsson, Sten A. L.: *See—*
Rothman, Ulf S. E.; and Jacobsson, Sten A. L., 4,537,767, Cl. 424-78.000.

Jacquart, Christian A.: *See—*
Ballatore, Daniel; Bonnet, Yves A.; Ferry, Michel F.; and Jacquart, Christian A., 4,538,032, Cl. 179-170.00D.

Jacquin, Yves: *See—*
Toulhoat, Herve ; Plumail, Jean-Claude; Mercier, Marc; and Jacquin, Yves, 4,537,875, Cl. 502-314.000.

Jaeger, Erhard: *See—*
Achinger, Michael; Jaeger, Erhard; Lipp, Reinhold; and Streitenberger, Walter, 4,537,238, Cl. 164-169.000.

Jahn, Robert G.: *See—*
Bruschtein, Fabio B.; Jahn, Robert G.; and Wittbrodt, Edwin L., 4,537,916, Cl. 523-201.000.

James, Benjamin B.; and Peel, Edward, to Westcode, Inc. Door panel position sensor assembly. 4,538,038, Cl. 200-61.710.

James C. Barber and Associates, Inc.: *See—*
Barber, James C., 4,537,615, Cl. 71-36.000.

Jansen, Harley W.: *See—*
Zylstra, Henry J.; and Jansen, Harley W., 4,538,194, Cl. 361-42.000.

Jansen, Herbert; Schiffers, Hans-Gunter; and Gerretz, Richard, to Mannesmann Demag Wean. Apparatus for testing pipes by a pipe tester. 4,537,407, Cl. 277-2.000.

Janssens, Wilhelmus: *See—*
Van de Sande, Christian C.; Verhecken, Andre ; and Janssens, Wilhelmus, 4,537,853, Cl. 430-218.000.

Japan Bano'k Co., Ltd.: *See—*
Furutsu, Akira, 4,536,933, Cl. 29-235.000.

Jaquet, Andre , to SIG Societe Industrielle Suisse. Railway work machine. 4,538,061, Cl. 250-201.000.

Jardin, Hans, to Webasto-Werk W. Baier GmbH & Co. Sliding and tilting roof for motor vehicles. 4,537,442, Cl. 296-221.000.

Jarnot, Frank R., to Airlette Manufacturing Corporation, Inc. Weather protective cover ventilator. 4,537,119, Cl. 98-52.000.

Jas, Jean-Noel, to Rhone-Poulenc Specialites Chimiques "Les Miroirs". Process for improving the rheological properties of a suspension of precipitated silica. 4,537,699, Cl. 252-313.200.

Jasserand, Daniel: *See—*
Heinemann, Henning; Jasserand, Daniel; Milkowski, Wolfgang; Yavordios, Dimitri; and Zeugner, Horst, 4,537,975, Cl. 548-359.000.

Jauch, Karl: *See—*
Baltes, Heinrich P.; Glass, Andrew S.; and Jauch, Karl, 4,537,504, Cl. 356-71.000.

Jemec, Raoul: *See—*
Zollinger, Max; and Jemec, Raoul, 4,537,671, Cl. 204-243.00R.

Jensen, Lyle B., to FMC Corporation. Heavy duty travel crane. 4,537,317, Cl. 212-189.000.

Jensen, Norman P.: *See—*
Chang, Michael N.; Hammond, Milton L.; Jensen, Norman P.; McDonald, John; and Zambias, Robert A., 4,537,903, Cl. 514-456.000.

JEOL Ltd.: *See*—
Takagi, Toshijiro; and Watanabe, Eiji, 4,537,477, Cl. 350-507.000.
Jet Research Center, Inc.: *See*—
Regalbuto, John A.; and Dines, Jack E., 4,537,255, Cl. 166-297.000.
Jet Spray Corp.: *See*—
Brown, Merle S.; and Arzberger, William A., 4,537,332, Cl. 222-190.000.
Jetter, Heinz: *See*—
Jetter, Rudolf; and Jetter, Heinz, 4,537,838, Cl. 429-9.000.
Jetter, Rudolf; and Jetter, Heinz, to Hartag AG. System with several panels containing photoelectric elements for the production of electric current. 4,537,838, Cl. 429-9.000.
Jinbo, Masahiro: *See*—
Akaba, Hayao; Yamada, Takeshi; and Jinbo, Masahiro, 4,537,480, Cl. 351-235.000.
Jochnick & Norrman Press AB: *See*—
Larsson, Gosta, 4,537,568, Cl. 418-202.000.
Joffre, Henri: *See*—
Bardoux, Raymond; and Joffre, Henri, 4,538,071, Cl. 250-505.100.
Johansson, Curt R. Tool for fastening an elongated object on a supporting surface. 4,537,343, Cl. 227-120.000.
Johansson, Soren; Andersson, Roger; and Jonsson, Lennart, to Stiga AB. Cone belt tightening device. 4,537,581, Cl. 474-123.000.
Johnson, Gary D.: *See*—
Stravitz, David M.; and Johnson, Gary D., 4,537,176, Cl. 124-62.000.
Johnson, Marvin M.; and McDaniel, Max P., to Phillips Petroleum Company. Rubber compositions containing aluminum phosphate. 4,537,928, Cl. 524-417.000.
Johnson Matthey Public Limited Company: *See*—
Cameron, Donald S., 4,537,839, Cl. 429-20.000.
Johnstone, James S.: *See*—
Lax, David R.; Page, Michael; and Johnstone, James S., 4,537,076, Cl. 73-662.000.
Jones, Charles E.: *See*—
Downey, Gale D.; and Jones, Charles E., 4,537,708, Cl. 252-554.000.
Jones, David E., to Mead Corporation, The. Fluid jet printer and method of operation. 4,538,157, Cl. 346-75.000.
Jones, Michael E., to Eaton Corporation. Vernier control device. 4,537,090, Cl. 74-502.000.
Jones, Robert A.; and Reichert, Jack R., to Kohler Co. Insulating liner for a water closet tank. 4,536,901, Cl. 4-416.000.
Jonsson, Lennart: *See*—
Johansson, Soren; Andersson, Roger; and Jonsson, Lennart, 4,537,581, Cl. 474-123.000.
Joost, Friedrich. Method of forming a folder for reports or statements of account and cover to effect the method. 4,537,544, Cl. 412-5.000.
Josefsson, Leif, to Flakt Aktiebolag. Surface treatment plant and a method of ventilating same. 4,537,120, Cl. 98-115.200.
Jost, John W.: *See*—
Gallup, Darrell L.; and Jost, John W., 4,537,684, Cl. 210-696.000.
Juhola, Mauno O.; and Numminen, Matti, to Pohjavahvistus Oy. Means for providing a vertical drain in soil. 4,537,527, Cl. 405-50.000.
Julius Blum Gesellschaft m.b.H.: *See*—
Rock, Erich; and Brustle, Klaus, 4,536,917, Cl. 16-288.000.
Jurgens, Rainer: *See*—
Illerhaus, Roland; and Jurgens, Rainer, 4,537,097, Cl. 76-108.00A.
KabiVitrum AB: *See*—
Claeson, Carl G.; and Gustavsson, Stig I., 4,537,896, Cl. 514-330.000.
Kabushiki Kaisha Daikin Seisakusho: *See*—
Fukatani, Yasunobu, 4,537,299, Cl. 192-107.00C.
Kabushiki Kaisha Hayashi Racing: *See*—
Hayashi, Masakazu, 4,537,449, Cl. 301-9.0CN.
Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo: *See*—
Miyake, Toshio; and Hijiiya, Hiromi, 4,537,763, Cl. 424-49.000.
Sugimoto, Kaname, 4,537,852, Cl. 435-215.000.
Kabushiki Kaisha Ishida Koki Seisakusho: *See*—
Sashiki, Takashi; and Sakaeda, Keiko, 4,537,229, Cl. 141-83.000.
Kabushiki Kaisha Kobe Seiko Sho: *See*—
Asari, Akira; Tsuzuki, Hidehiro; Inoue, Yoichi; and Tabuchi, Takahisa, 4,537,569, Cl. 425-405.00H.
Ooshiro, Takehiko; Iwasaki, Masayoshi; Sahara, Kousuke; Suzuki, Norio; Utsumi, Hitoshi; Miyake, Kazuo; and Aburatani, Kenji, 4,537,073, Cl. 73-602.000.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Fukushima, Akira; and Sugimoto, Yutaka, 4,537,268, Cl. 180-9.100.
Funabashi, Tetsuji; and Kobayashi, Shingo, 4,537,259, Cl. 172-4.500.
Kabushiki Kaisha Sankyo Seiki Seisakusho: *See*—
Miyako, Haruyoshi; and Arima, Kiyoteru, 4,538,258, Cl. 369-271.000.
Kabushiki Kaisha Suwa Seikosha: *See*—
Iwamatsu, Seiichi, 4,538,291, Cl. 378-119.000.
Moriya, Tatsuo, 4,537,514, Cl. 368-107.000.
Shinohara, Toshihide; and Okazaki, Sakiho, 4,537,479, Cl. 351-169.000.
Teraishi, Katsuhiro, 4,537,653, Cl. 156-620.000.
Kabushiki Kaisha Toshiba: *See*—
Denpou, Kazuo; Eto, Kazumi; and Niida, Hideo, 4,537,041, Cl. 62-199.000.
Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Tooka, Takuzo, 4,537,018, Cl. 57-90.000.
Kabushiki Kaisha Tsumurajuntendo: *See*—
Kooda, Akihide; Nishioka, Itsuo; Nishiyori, Takeshi; and Yahara, Shoji, 4,537,996, Cl. 568-442.000.
Kadowaki, Satoshi; and Ikeda, Yuzi, to Honda Giken Kogyo Kabushiki Kaisha. Apparatus for assembling motorcar body. 4,538,044, Cl. 219-80.000.
Kadowaki, Takashi: *See*—
Takada, Shun; Onodera, Kaoru; and Kadowaki, Takashi, 4,537,857, Cl. 430-549.000.
Kagotani, Masahiro: *See*—
Kojima, Hidetaka; Horikawa, Takeshi; and Kagotani, Masahiro, 4,537,997, Cl. 568-454.000.
Kaim, John W.; Berg, Norman A.; and Altherr, Russell G., to AMSTED Industries Incorporated. Railway, coupler yoke, draft gear and follower assembly. 4,537,304, Cl. 206-335.000.
Kaiser, Harry: *See*—
Hinke, Walter; and Kaiser, Harry, 4,538,082, Cl. 310-152.000.
Kajita, Hideo: *See*—
Ueda, Hiroshi; Saito, Mitsuru; and Kajita, Hideo, 4,537,732, Cl. 264-1.100.
Kajiwara, Toshiyuki; and Kojima, Tatsuji, to Hitachi, Ltd. Method for RD rolling sheet metal. 4,537,057, Cl. 72-243.000.
Kaken Pharmaceutical Co., Ltd.: *See*—
Ogawa, Tetsuya; Saitoh, Shinichi; Inoi, Takeshi; Kato, Masaji; and Obara, Heitaro, 4,537,999, Cl. 568-584.000.
Kakizaki, Yukio; Izawa, Hisao; and Hazama, Junji, to Nippon Kogaku K.K. Apparatus for the attitude control of plate-form body. 4,537,501, Cl. 355-76.000.
Kakumu, Masakazu, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of manufacturing a FET. 4,536,943, Cl. 29-571.000.
Kali-Chemie Pharma GmbH: *See*—
Heinemann, Henning; Jasserand, Daniel; Milkowski, Wolfgang; Yavordios, Dimitri; and Zeugner, Horst, 4,537,975, Cl. 548-359.000.
Kalz, Dietmar: *See*—
Ellis Margaret D.; Ferencz, Richard L.; and Kalz, Dietmar, 4,537,991, Cl. 564-133.000.
Kambanis, Stamatis M.; Berchem, Antoine; Gregoire, Dennis; and Rybicky, Jaroslav, to Reichhold Limited. Lignin-modified phenolic adhesives for pressed wood products. 4,537,941, Cl. 527-403.000.
Kambara, Shu; Arakawa, Tatsumi; and Takahashi, Akio, to Director-General of Agency of Industrial Science and Technology. Polyvinylene sulfide and polyvinylene selenide. 4,537,950, Cl. 528-380.000.
Kamiishi, Hirofumi: *See*—
Matsuura, Kazuo; Shikatani, Yutaka; Kamiishi, Hirofumi; Kuroda, Nobuyuki; and Miyoshi, Mituji, 4,537,938, Cl. 526-97.000.
Kamil, Zvi, to Elscint Ltd. Cryogenic magnet systems. 4,537,033, Cl. 62-3.000.
Kamiya, Masashi; Sumiya, Mitsuo; and Yamaguchi, Ryoji, to Tokyo Shibaura Denki Kabushiki Kaisha. Electric motor with hydrodynamic pressure and magnetic thrust bearings. 4,538,081, Cl. 310-90.000.
Kamiyama, Tadanobu: *See*—
Kanno, Masayuki; Tezuka, Hisao; Izawa, Kouji; and Kamiyama, Tadanobu, 4,538,183, Cl. 358-280.000.
Kamo, Tomoichi: *See*—
Kato, Akira; Kamo, Tomoichi; Uno, Shigeo; Kawagoshi, Hiroshi; Yamashita, Hisao; and Matsuda, Shinpei, 4,537,873, Cl. 502-242.000.
Kamyr, Inc.: *See*—
Sherman, Michael I., 4,536,969, Cl. 34-9.000.
Kanamori, Toshio, to Sumitomo Heavy Industries, Ltd. Metal supporting structure for continuous casting machines. 4,537,241, Cl. 164-442.000.
Kancnik, Adolph V.; and Klancnik, Kenneth A., to Universal Automatic Corporation. Machine tool fixture. 4,537,389, Cl. 269-34.000.
Kanda, Akihiro: *See*—
Sadamatsu, Hideaki; Inoue, Michihiro; Kanda, Akihiro; and Matsuzawa, Akira, 4,536,950, Cl. 29-578.000.
Kanehara, Kenji; Kohama, Tokio; Kawai, Hisasi; and Tokura, Norihito, to Nippon Soken, Inc. Fuel supply control apparatus for an internal-combustion engine. 4,537,172, Cl. 123-527.000.
Kaneko, Takashi: *See*—
Yoshimura, Isao; Hata, Hideo; and Kaneko, Takashi, 4,537,935, Cl. 525-222.000.
Kanno, Masayuki; Tezuka, Hisao; Izawa, Kouji; and Kamiyama, Tadanobu, to Tokyo Shibaura Denki Kabushiki Kaisha. Image editing apparatus. 4,538,183, Cl. 358-280.000.
Kansas State University Research Foundation: *See*—
Proctor, Valerie A.; and Cunningham, Franklin E., 4,537,788, Cl. 426-614.000.
Kanyicska, Bela: *See*—
Deak, Gyula; Zara nee Kaczian, Erzsebet; Gyorgy, Lajos; Fekete, Marton; Doda, Margit; Seregi, Andras; Kanyicska, Bela; Toth nee Pecsi, Erzsebet; Horvath nee Gaal, Maria; Manyai, Sandor; Gorgenyi, Frigyes; and Vaszovics nee Reichmann, Gyorgyi, 4,537,895, Cl. 514-307.000.
Kaplan, Uri, to Ormat Turbines (1965) Ltd. Parallel-stage modular Rankine cycle turbine with improved control. 4,537,032, Cl. 60-662.000.
Kapoor, Anoop: *See*—
Wilhelm, John J.; Kapoor, Anoop; Kobuck, Richard M.; Antol, Ronald F.; and Norris, George W., 4,537,711, Cl. 252-633.000.

Karrer, Friedrich: *See*—
Slongo, Mario; and Karrer, Friedrich, 4,537,923, Cl. 524-100.000.
Kaspaul, Alfred F.: *See*—
Shalhoob, William N.; and Kaspaul, Alfred F., 4,537,181, Cl. 128-1.300.
Kassner, James E.: *See*—
Rebhahn, Robert W. J.; Kassner, James E.; and Werner, Raymond E., 4,537,971, Cl. 546-320.000.
Kastle Gesellschaft m.b.H.: *See*—
Hirnbock, Rudolf; and Haudum, Adolf, 4,537,417, Cl. 280-602.000.
Kastner, Ralph E.: *See*—
Hamill, Robert L.; and Kastner, Ralph E., 4,537,879, Cl. 514-9.000.
Michel, Karl H.; and Kastner, Ralph E., 4,537,770, Cl. 424-118.000.
Kasuga, Akira; Yamamoto, Nobuyuki; and Miyatsuka, Hajime, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,537,833, Cl. 428-328.000.
Kato, Akira; Kamo, Tomoichi; Uno, Shigeo; Kawagoshi, Hiroshi; Yamashita, Hisao; and Matsuda, Shinpei, to Hitachi, Ltd. Catalyst for catalytic combustion. 4,537,873, Cl. 502-242.000.
Kato, Masaaki; and Akashi, Tetsuji, to Nippondenso Co., Ltd. Fuel injection apparatus. 4,537,352, Cl. 239-90.000.
Kato, Masaji: *See*—
Ogawa, Tetsuya; Saitoh, Shinichi; Inoi, Takeshi; Kato, Masaji; and Obara, Heitaro, 4,537,999, Cl. 568-584.000.
Kato, Masanori: *See*—
Tsuge, Noboru; Taguchi, Masahiro; Kato, Masanori; and Kuwakado, Satosi, 4,537,169, Cl. 123-325.000.
Kato, Toshihisa; Iwagami, Hisao; and Yasuda, Naohiko, to Ajinomoto Company Incorporated. 4-Methylsulfonyl-azetidinone derivatives. 4,537,719, Cl. 260-239.00A.
Kato, Yoshiharu: *See*—
Okabe, Shinsei; Komatsu, Hiroshi; Hamaji, Yukio; Kojima, Shozo; and Kato, Yoshiharu, 4,537,865, Cl. 501-135.000.
Katsuhiko Ohki: *See*—
Ogawa, Tetsuo, 4,537,563, Cl. 417-226.000.
Kavouras, Inc.: *See*—
Baltzer, Karen L.; and Peterson, Jan B., 4,538,229, Cl. 364-428.000.
Kawada, Shigeki; Amemiya, Yoichi; Sogabe, Masatoyo; and Iwamatsu, Noboru, to Fanuc Ltd. Stator of motor. 4,538,084, Cl. 310-217.000.
Kawada, Yasuyuki: *See*—
Morita, Hiroshi; Kawada, Yasuyuki; Yamada, Junichi; and Ukigai, Toshiyuki, 4,537,253, Cl. 166-274.000.
Kawagoshi, Hiroshi: *See*—
Kato, Akira; Kamo, Tomoichi; Uno, Shigeo; Kawagoshi, Hiroshi; Yamashita, Hisao; and Matsuda, Shinpei, 4,537,873, Cl. 502-242.000.
Kawaguchi, Susumu; and Morinushi, Ken, to Mitsubishi Denki Kabushiki Kaisha. Rolling piston type compressor. 4,537,567, Cl. 418-63.000.
Kawai, Hisasi: *See*—
Kanehara, Kenji; Kohama, Tokio; Kawai, Hisasi; and Tokura, Norihito, 4,537,172, Cl. 123-527.000.
Kawai, Tohru: *See*—
Tsubonuma, Yoshio; and Kawai, Tohru, 4,537,536, Cl. 405-267.000.
Kawakami, Hidehiko: *See*—
Otsuka, Hirotaka; Nakazato, Katsuo; Sannomiya, Kunio; Kawakami, Hidehiko; Tsuchiya, Hiroyoshi; and Uchida, Hideo, 4,538,184, Cl. 358-283.000.
Kawakami, Hironori: *See*—
Tajima, Hiroto; Kawakami, Hironori; Mashino, Zenichi; Hayami, Seinoshin; and Ohzeki, Osamu, 4,537,600, Cl. 44-51.000.
Kawakami, Yukichika; Shiiki, Zenya; and Iizuka, Yo, to Kureha Kagaku Kogyo Kabushiki Kaisha. Process for producing aromatic sulfide polymer with alkaline earth metal oxide dehydrating agent. 4,537,953, Cl. 528-388.000.
Kawamura, Eiichi: *See*—
Takigawa, Nobuhiro; Watanabe, Hideo; Kawasaki, Kanzirou; Kubo, Keishi; Hakiri, Minoru; and Kawamura, Eiichi, 4,538,164, Cl. 346-209.000.
Kawasaki, Akihisa; Tada, Kohji; Kotani, Toshihiro; and Miyazawa, Shintaro, to Sumitomo Electric Industries, Ltd.; and Nippon Telegraph & Telephone Public Corp. Process for preparing single crystal. 4,537,652, Cl. 156-617.0SP.
Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Shirai, Tetsuaki, 4,537,160, Cl. 123-41.580.
Kawasaki, Kanzirou: *See*—
Takigawa, Nobuhiro; Watanabe, Hideo; Kawasaki, Kanzirou; Kubo, Keishi; Hakiri, Minoru; and Kawamura, Eiichi, 4,538,164, Cl. 346-209.000.
Kay, Fern. Safety vest or harness for pets or small children. 4,537,154, Cl. 119-96.000.
Kaye, Stanley B.: *See*—
Stevens, Keith D.; Harrison, John; and Kaye, Stanley B., 4,538,171, Cl. 357-81.000.
Kazlauskas, Gasparas. Precise positioning for a welding electrode which follows a three dimensional weld path. 4,538,046, Cl. 219-125.100.
Keane, John J.; and Pauze, Denis R., to General Electric Company. Corona-resistant wire enamel compositions and conductors insulated therewith. 4,537,804, Cl. 427-118.000.
Keats, Dennis R.: *See*—
Vahlstrom, Richard; and Keats, Dennis R., 4,538,223, Cl. 364-200.000.
Keck, John F. Tool for straightening jewelry chain. 4,537,098, Cl. 81-488.000.
Keely, Leroy B.: *See*—
Freige, Diab E.; Lockwood, John J.; Ramsay, Michael; and Keely, Leroy B., 4,538,073, Cl. 307-33.000.
Keesee, Kenneth M.; and Guyer, John R., to Keesee Tank and Pump Co., Inc. Storage tank. 4,537,328, Cl. 220-445.000.
Keesee Tank and Pump Co., Inc.: *See*—
Keesee, Kenneth M.; and Guyer, John R., 4,537,328, Cl. 220-445.000.
Kehrer, Hans-Peter; Villain, Juergen; and Reiff, Werner, to Siemens Aktiengesellschaft. Method for generating hard, wear-proof surface layers on a metallic material. 4,537,793, Cl. 427-35.000.
Keil, Joseph W., to Dow Corning Corporation. Oil emulsions of fluorosilicone fluids. 4,537,677, Cl. 208-370.000.
Keim, Gerald I., to Hercules Incorporated. Wet strength resins. 4,537,657, Cl. 162-164.300.
Keledjian, Gaston: *See*—
Passemard, Jean R.; and Keledjian, Gaston, 4,537,084, Cl. 74-89.220.
Keller, Frank: *See*—
Gazzoli, Italo; and Keller, Frank, 4,538,028, Cl. 179-2.0EA.
Gazzoli, Italo; and Keller, Frank, 4,538,029, Cl. 179-2.0EA.
Keller, Michael: *See*—
Herold, Wolf-Dietrich; Grafwallner, Karl L.; and Keller, Michael, 4,538,070, Cl. 250-504.00R.
Keller, Paul D.: *See*—
Lubinsky, Anthony R.; Denton, Gary A.; Keller, Paul D.; and Williams, James E., 4,537,494, Cl. 355-3.0DD.
Keller, Wolfgang, to Siemens Aktiengesellschaft. Induction coil in the form of a pancake coil for crucible-free zone melting. 4,538,279, Cl. 373-139.000.
Kelly, Gary W.: *See*—
Delahoussaye, Ronald D.; and Kelly, Gary W., 4,537,415, Cl. 280-242.0WC.
Kelly, Oscar. Nursing bottle holder. 4,537,341, Cl. 224-202.000.
Kelsey-Hayes Company: *See*—
Evans, Anthony C., 4,537,290, Cl. 188-73.310.
Kendall Company, The: *See*—
Schortmann, Walter E.; and Metrick, Dennis, 4,537,819, Cl. 428-284.000.
Kennard, Alfred J.: *See*—
Kennedy, Alvin B., III; Fontaine, Joseph S.; Kennard, Alfred J.; and Morrison, J. Bruce, 4,537,685, Cl. 210-709.000.
Kennedy, Alexander W.: *See*—
Gunn, Walter H.; and Kennedy, Alexander W., 4,537,837, Cl. 428-621.000.
Kennedy, Alvin B., III; Fontaine, Joseph S.; Kennard, Alfred J.; and Morrison, J. Bruce, to Methods Engineering,Inc. Method for separating intermixed solids and liquids. 4,537,685, Cl. 210-709.000.
Kensler, Terry T.: *See*—
Alexander, Robert L.; Bequette, Robert J.; Kensler, Terry T.; and Scott, Joseph A., 4,537,883, Cl. 514-110.000.
Kern & Co. Ltd.: *See*—
Boutellier, Roman, 4,537,464, Cl. 350-1.400.
Kern, Hans, to Siemens Aktiengesellschaft. Speed control circuit for a DC motor. 4,538,096, Cl. 318-314.000.
Kern, Otmar, to Georg Neumann GmbH. Method of and system for cutting a phonograph record with two-channel modulation. 4,538,255, Cl. 369-51.000.
Kersten, Siegfried: *See*—
Reissenweber, Gernot; Kersten, Siegfried; Ditter, Walter; and Jacobs, Peter, 4,537,986, Cl. 560-132.000.
Ketterer, Klaus, to Voest Alpine AG. Excavating head with pick-controlled water supply. 4,537,448, Cl. 299-81.000.
Ketterson, John B.: *See*—
Abraham, Bernard M.; Miyano, Kenjiro; and Ketterson, John B., 4,537,064, Cl. 73-54.000.
Khandwala, Bhupendra J.: *See*—
Young, Jorge A.; and Khandwala, Bhupendra J., 4,538,056, Cl. 235-377.000.
Kiamco, Roberto C.; and Skipor, Eugene, Jr., to Rockwell International Corporation. High speed folder fly. 4,537,390, Cl. 270-53.000.
Kienle, Gerhard K. Internal combustion engine having a rotating piston assembly. 4,537,162, Cl. 123-43.00R.
Kiernan, James T. Skiing accessory. 4,537,419, Cl. 280-607.000.
Kilner, Peter H.; Egan, Joseph P., Jr.; Ceisel, Stephen G.; and Schammel, Wayne P., to Standard Oil Company (Indiana). Process for the production of trimellitic anhydride. 4,537,978, Cl. 549-245.000.
Kimura, Akira; Ishihama, Masao; Abe, Toshiro; Shimada, Kiyoshi; and Matsui, Shinichi, to Nissan Motor Co., Ltd. Vibration responsive mounting arrangement for automotive engine. 4,537,275, Cl. 180-300.000.
Kimura, Hideyuki: *See*—
Yamada, Keiichi; and Kimura, Hideyuki, 4,537,170, Cl. 123-449.000.
Kimura, Kenji; and Nishikawa, Masayasu, to Honda Giken Kogyo Kabushiki Kaisha. Lubricating arrangement in valve mechanism of an overhead camshaft engine. 4,537,166, Cl. 123-90.360.
Kimura, Sosaku: *See*—
Shimizu, Masami; Yoshikawa, Hisao; Kimura, Sosaku; Shiba, Kazuo; Maeno, Fumio; Fuwa, Shigehiro; and Mihara, Kuniyuki, 4,536,993, Cl. 51-165.800.
Kimura, Tetsuo, to Nittan Company, Limited. Fire detector. 4,538,137, Cl. 340-512.000.
King, Francis X.: *See*—
Shanklin, Frank G.; and King, Francis X., 4,537,016, Cl. 53-493.000.

Kinney, Richard G.: *See*—
McGill, Leland S., 4,536,902, Cl. 4-476.000.
Kinoshita, Akira: *See*—
Takahashi, Jiro; Sawada, Kiyoshi; Kinoshita, Akira; Komamura, Tawara; Goto, Satoshi; and Sasaki, Osamu, 4,537,847, Cl. 430-58.000.
Kinsolving, Clyde R.: *See*—
Griffith, Ronald C.; and Kinsolving, Clyde R., 4,537,908, Cl. 514-659.000.
Kippenberg, Horst: *See*—
Hassler, Heinrich; Muller, Reiner; Kippenberg, Horst; and Prolss, Norbert, 4,537,745, Cl. 420-590.000.
Kircher, Hartmann J., to Grumman Aerospace Corporation. Multifunction composite material utilizing embedded optical fibers. 4,537,469, Cl. 350-96.240.
Kirjavainen, Kari; and Riekkinen, Asko S. Imprint control system with feedback feature. 4,538,173, Cl. 358-75.000.
Kishi, Norimasa: *See*—
Noso, Kazunori; and Kishi, Norimasa, 4,538,295, Cl. 381-43.000.
Kita, Nobuyuki: *See*—
Ohba, Hisao; Uchida, Toshio; Ohashi, Azusa; and Kita, Nobuyuki, 4,537,496, Cl. 355-10.000.
Kitawaki, Nobuhiko: *See*—
Honda, Masaaki; Itakura, Fumitada; and Kitawaki, Nobuhiko, 4,538,234, Cl. 364-513.500.
Kitayama, Minoru; Nakamura, Motoharu; Hirose, Kikuji; and Tanida, Masashi, to Nippon Steel Corporation. Method of applying an annealing separator to grain oriented magnetic steel sheets. 4,537,792, Cl. 427-13.000.
Kittel, Friedrich: *See*—
Fadler, Kurt; and Kittel, Friedrich, 4,537,295, Cl. 192-106.200.
Kiuchi, Kazuhide: *See*—
Yoshino, Hideo; Arai, Eisuke; and Kiuchi, Kazuhide, 4,538,167, Cl. 357-59.000.
Kivel, Daniel M.; and Weber, Gerhard M., to Grow Group, Inc. Aqueous chip resistant coating composition. 4,537,926, Cl. 524-388.000.
Klancnik, Kenneth A.: *See*—
Kancnik, Adolph V.; and Klancnik, Kenneth A., 4,537,389, Cl. 269-34.000.
Klinger, Lance T., to Xerox Corporation. Adaptively stabilized recording for direct read after write optical memories. 4,538,257, Cl. 369-106.000.
Klockner-Humboldt-Deutz AG: *See*—
Pfeiffer, Roland; and Waldhecker, Heinz-Dieter, 4,537,626, Cl. 75-35.000.
Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Knepper, Herbert, 4,537,260, Cl. 172-9.000.
Nau, Walter; and Carstensen, Jes, 4,537,423, Cl. 280-759.000.
Klufas, Oleg: *See*—
Emeterio, Eloy V.; Deallenbach, Robert E.; O'Connor, Martin F.; and Klufas, Oleg, 4,537,560, Cl. 416-198.00A.
Knabel, Walter R.; and Sedlmair, Gerhard J., to Marker International. Ski brake. 4,537,418, Cl. 280-605.000.
Knels, Kenneth J. Bale carrier. 4,537,549, Cl. 414-24.500.
Knepper, Herbert, to Klockner-Humboldt-Deutz Aktiengesellschaft. Apparatus with rear and front power lift, common regulating and control elements, and changeover valve. 4,537,260, Cl. 172-9.000.
Knorr-Bremse GmbH: *See*—
Brearey, Nicholas J.; and Baumgarth, Rolf, 4,538,228, Cl. 364-426.000.
Kobayashi, Atsushi: *See*—
Mitani, Ryo; Moriya, Yoshiaki; and Kobayashi, Atsushi, 4,538,145, Cl. 340-805.000.
Kobayashi, Fumihiko: *See*—
Imai, Takafumi; and Kobayashi, Fumihiko, 4,537,944, Cl. 528-18.000.
Kobayashi, Kunihilo: *See*—
Tanaka, Masaho; Shishido, Tomio; Fukuhara, Tetsukazu; Yao, Yugo; Kobayashi, Kunihilo; and Inoue, Yoshio, 4,538,042, Cl. 219-58.000.
Kobayashi, Shingo: *See*—
Funabashi, Tetsuji; and Kobayashi, Shingo, 4,537,259, Cl. 172-4.500.
Kobayashi, Yukio: *See*—
Shishikura, Toshikazu; Konuma, Hiroshi; Nakamura, Hidenori; and Kobayashi, Yukio, 4,537,843, Cl. 429-197.000.
Kober AG: *See*—
Huber, Reinhold; and Koster, Waldemar, 4,537,003, Cl. 52-573.000.
Kober, Rainer: *See*—
Billet, Reinhard; Kober, Rainer; Mackowiak, Jerzy; and Geipel, Werner, 4,537,731, Cl. 261-94.000.
Koboshi, Shigeharu: *See*—
Kurematsu, Masayuki; and Koboshi, Shigeharu, 4,537,856, Cl. 430-372.000.
Kobuck, Richard M.: *See*—
Wilhelm, John J.; Kapoor, Anoop; Kobuck, Richard M.; Antol, Ronald F.; and Norris, George W., 4,537,711, Cl. 252-633.000.
Koch, Wolfgang: *See*—
Idel, Karsten; Ostlinning, Edgar; Koch, Wolfgang; Bottenbruch, Ludwig; and Heitz, Walter, 4,537,951, Cl. 528-388.000.
Koermer, Gerald S.: *See*—
Linstid, H. Clay, III; and Koermer, Gerald S., 4,537,995, Cl. 568-384.000.
Koerner, Gotz: *See*—
Gruning, Burghard; Holtschmidt, Ulrich; and Koerner, Gotz, 4,537,595, Cl. 8-115.600.
Koestler, Dennis J.: *See*—
Hwang, Kyu S.; and Koestler, Dennis J., 4,537,178, Cl. 126-110.00R.
Kohama, Tokio: *See*—
Kanehara, Kenji; Kohama, Tokio; Kawai, Hisasi; and Tokura, Norihito, 4,537,172, Cl. 123-527.000.
Kohlensaure-Werke Rudolf Buse Sohn GmbH & Co.: *See*—
Ernst, Werner, 4,537,062, Cl. 73-38.000.
Kohler Co.: *See*—
Jones, Robert A.; and Reichert, Jack R., 4,536,901, Cl. 4-416.000.
Kohler, Egon: *See*—
Feyen, Peter; Seifert, Hermann; and Kohler, Egon, 4,537,730, Cl. 260-989.000.
Kohmoto, Osamu; Takasugi, Yasufumi; Sugihara, Hiroshi; and Nishimatsu, Masaharu, to TDK Corporation. Magnetic recording medium. 4,537,832, Cl. 428-216.000.
Kohs, Dwight W., to AT&T Information Systems Inc. Single parity bit generation circuit. 4,538,271, Cl. 371-49.000.
Kojima, Hidetaka; Horikawa, Takeshi; and Kagotani, Masahiro, to Daicel Chemical Industries, Ltd.; and Kuraray Co., Ltd. Process for treating hydroformylation catalyst. 4,537,997, Cl. 568-454.000.
Kojima, Shozo: *See*—
Okabe, Shinsei; Komatsu, Hiroshi; Hamaji, Yukio; Kojima, Shozo; and Kato, Yoshiharu, 4,537,865, Cl. 501-135.000.
Kojima, Tatsuji: *See*—
Kajiwara, Toshiyuki; and Kojima, Tatsuji, 4,537,057, Cl. 72-243.000.
Kojiro, Daniel R.: *See*—
Carle, Glenn C.; Kojiro, Daniel R.; and Humphry, Donald E., 4,538,066, Cl. 250-374.000.
Kok, Johannes A. G.: *See*—
Apontoweil, Peter; and Kok, Johannes A. G., 4,537,768, Cl. 424-89.000.
Kokusai Denshin Denwa Co., Ltd.: *See*—
Yamamura, Kazuomi; Ishihara, Hideo; Iwamoto, Yoshinao; Sakaguchi, Hifumi; Morita, Masao; and Izawa, Toshio, 4,537,530, Cl. 405-160.000.
Kolc, Jaroslav F.: *See*—
Van Der Puy, Michael; Kolc, Jaroslav F.; Anello, Louis G.; Hendrickson, Larry L.; Rogic, Milorad M.; and Swerdloff, Michael D., 4,537,614, Cl. 71-28.000.
Kollmorgen Technologies: *See*—
Taylor, William H., 4,538,181, Cl. 358-208.000.
Kollmorgen Technologies, Corporation: *See*—
England, Thomas R., 4,538,080, Cl. 310-154.000.
Komada, Kenya; Yuasa, Kazuhiro; and Kondoh, Shiroh, to Ricoh Company, Ltd. Development apparatus for developing latent electrostatic images. 4,537,491, Cl. 355-3.0DD.
Komaju, Shigeru: *See*—
Takagi, Masayuki; Mugiya, Hiroshi; and Komaju, Shigeru, 4,538,102, Cl. 323-349.000.
Komakine, Shigeo: *See*—
Ochiai, Kuniaki; and Komakine, Shigeo, 4,537,520, Cl. 400-124.000.
Komamura, Tawara: *See*—
Takahashi, Jiro; Sawada, Kiyoshi; Kinoshita, Akira; Komamura, Tawara; Goto, Satoshi; and Sasaki, Osamu, 4,537,847, Cl. 430-58.000.
Komarneni, Sridhar; and Roy, Della M., to United States of America, Energy. Method of storing radioactive wastes using modified tobermorite. 4,537,710, Cl. 252-628.000.
Komatsu, Hiroshi: *See*—
Okabe, Shinsei; Komatsu, Hiroshi; Hamaji, Yukio; Kojima, Shozo; and Kato, Yoshiharu, 4,537,865, Cl. 501-135.000.
Komori, Shinichi: *See*—
Iwase, Seiichiro; and Komori, Shinichi, 4,538,172, Cl. 358-13.000.
Kondoh, Shiroh: *See*—
Komada, Kenya; Yuasa, Kazuhiro; and Kondoh, Shiroh, 4,537,491, Cl. 355-3.0DD.
Konishi, Tadashi: *See*—
Nakayama, Taesuke; and Konishi, Tadashi, 4,538,079, Cl. 310-74.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Abe, Shunichi; Akiyama, Mitsuo; and Kudo, Yoshihiko, 4,538,231, Cl. 364-483.000.
Asano, Masao; Fujimatsu, Wataru; Matsumoto, Kazumasa; Murata, Hideki; Sato, Toshihiko; and Watanabe, Kenji, 4,537,824, Cl. 428-323.000.
Kurematsu, Masayuki; and Koboshi, Shigeharu, 4,537,856, Cl. 430-372.000.
Saito, Kaneo, 4,537,485, Cl. 354-304.000.
Takada, Shun; Onodera, Kaoru; and Kadowaki, Takashi, 4,537,857, Cl. 430-549.000.
Takahashi, Jiro; Sawada, Kiyoshi; Kinoshita, Akira; Komamura, Tawara; Goto, Satoshi; and Sasaki, Osamu, 4,537,847, Cl. 430-58.000.
Konuma, Hiroshi: *See*—
Shishikura, Toshikazu; Konuma, Hiroshi; Nakamura, Hidenori; and Kobayashi, Yukio, 4,537,843, Cl. 429-197.000.
Kooda, Akihide; Nishioka, Itsuo; Nishiyori, Takeshi; and Yahara, Shoji, to Kabushiki Kaisha Tsumurajuntendo. Hydroxybiphenyl compounds. 4,537,996, Cl. 568-442.000.
Kopko, John J., to Zerox Corporation. Multispeed development system. 4,537,495, Cl. 355-3.0DD.
Kopp, Harold W. Football kicking tee. 4,537,397, Cl. 273-55.00B.

Kopp, Robert W.: *See*—
Siemers, Paul A.; Kopp, Robert W.; and Jackson, Melvin R., 4,537,742, Cl. 419-8.000.

Koppel, Gary A.: *See*—
Barton, Russell L.; Briggs, Stephen L.; and Koppel, Gary A., 4,537,727, Cl. 260-455.00R.

Kornfeld, Edmund C.: *See*—
Titus, Robert D.; and Kornfeld, Edmund C., 4,537,893, Cl. 514-293.000.

Koroncai, Adam; Nowak, Alfred; and Piber, Herbert, to U.S. Philips Corporation. Reciprocatingly drivable cutter for a dry-shaving apparatus. 4,536,956, Cl. 30-43.920.

Koski, Erkki, to Valmet Oy. Supporting beam for a foil in a paper machine. 4,537,659, Cl. 162-352.000.

Koslow, Evan E., to Pall Corporation. System for removing contaminant particles from a gas. 4,537,608, Cl. 55-337.000.

Koster, Waldemar: *See*—
Huber, Reinhold; and Koster, Waldemar, 4,537,003, Cl. 52-573.000.

Kosuge, Wataru: *See*—
Nakajima, Hirohito; Haji, Katsumi; Shibata, Yoji; and Kosuge, Wataru, 4,538,176, Cl. 358-86.000.

Kotani, Toshihiro: *See*—
Kawasaki, Akihisa; Tada, Kohji; Kotani, Toshihiro; and Miyazawa, Shintaro, 4,537,652, Cl. 156-617.0SP.

Kotecha, Harish N.: *See*—
Bracco, Al M.; Edenfeld, Arthur R.; and Kotecha, Harish N., 4,536,944, Cl. 29-571.000.

Kotter, Wolfgang, to Robert Bosch GmbH. Hydraulic directional valve for controlling double-acting motor. 4,537,218, Cl. 137-596.130.

Koumura, Noboru: *See*—
Saito, Seiji; Ayata, Naoki; Suzuki, Hidetoshi; Ozawa, Kunitaka; and Koumura, Noboru, 4,538,182, Cl. 358-280.000.

Kovacic, Guido: *See*—
Boie, Immo; Luhrig, Hermann; and Kovacic, Guido, 4,537,486, Cl. 354-317.000.

Kovacs, Paul. Device for the monitoring of ice formation. 4,538,064, Cl. 250-231.00R.

Kowal, Leon. Retrieval device for fishing tackle. 4,536,984, Cl. 43-17.200.

Koyama, Kiyomi, to Tokyo Shibaura Denki Kabushiki Kaisha. Electron-beam lithographic apparatus. 4,538,232, Cl. 364-491.000.

Kozel, Charles A.: *See*—
Brown, Vincent B.; Kozel, Charles A.; Scheitz, John T.; and Armando, John E., 4,537,456, Cl. 339-99.00R.

Kozi, Martin F.: *See*—
DeMeyer, Roy W.; and Kozi, Martin F., 4,537,061, Cl. 73-290.00R.

Kracke, Alan G.: *See*—
Hennenfent, Douglas J.; Holmstrand, Allan L.; and Kracke, Alan G., 4,536,992, Cl. 51-109.00R.

Krallmann, Reinhold: *See*—
Bergmann, Udo; Degen, Helmut; Hansen, Guenter; Krallmann, Reinhold; and Weber, Hans, 4,537,597, Cl. 8-639.000.

Kramer, Dennis M.: *See*—
Bielinski, Ralph F.; Chacon, M. Frank; Kramer, Dennis M.; Mathias, William R.; and Schneider, Stanley, 4,538,199, Cl. 361-93.000.

Kraus, Charles E., to Excelermatic Inc. Fixed ratio traction roller transmission. 4,537,093, Cl. 74-798.000.

Kravas, Helen A.: *See*—
Gillberg-La Force, Gunilla E.; and Kravas, Helen A., 4,537,931, Cl. 524-510.000.

Kreamer, William C., to FMC Corporation. Method and apparatus for packaging articles such as fruit. 4,537,009, Cl. 53-441.000.

Krebs, William T. Curved surface sanding device. 4,536,994, Cl. 51-328.000.

Kreid!, Janos; Farkas nee Kirjak, Maria; Harsanyi, Kalman; Benke, Bela ; Rado, Andras; Domany, Gyorgy; Hegedus, Bela; Csongor, Eva; Deutsch nee Juhasz, Ida; and Petho, Hajnalka, to Richter Gedeon Vegyeszeti Gyar R.T. Cimetidine Z, a new crystal modification of cimetidine. 4,537,900, Cl. 514-400.000.

Kreisel, Rudolf; and Meyer, Walter, to Schering Aktiengesellschaft. Rinsing of articles to remove an adhering substance. 4,537,640, Cl. 134-18.000.

Krepela, Josef; and Friedrich, Jaromir, to Bralorne Resources Limited. Engine shutdown valve. 4,537,386, Cl. 251-302.000.

Kristensson, Sten K.: *See*—
Stamvik, Anders R.; Kristensson, Sten K.; and Lundvall, Karl-Erik, 4,537,722, Cl. 260-397.400.

Krogsrud, Harald, to Elkem a/s. Method and means of charging electrothermic smelting furnaces. 4,537,551, Cl. 414-199.000.

Kronfeld, Leonard E., to Nortronics Company, Inc. Optical inspection and alignment verification system. 4,537,509, Cl. 356-399.000.

Krys, Joseph F.: *See*—
McNesby, John B.; and Krys, Joseph F., 4,538,286, Cl. 375-112.000.

Ku, Walter H.: *See*—
Chao, Pane-Chane; and Ku, Walter H., 4,536,942, Cl. 29-571.000.

Kubo, Keishi: *See*—
Takigawa, Nobuhiro; Watanabe, Hideo; Kawasaki, Kanzirou; Kubo, Keishi; Hakiri, Minoru; and Kawamura, Eiichi, 4,538,164, Cl. 346-209.000.

Kubota, Ltd.: *See*—
Ito, Katsumi; and Fuziwara, Osami, 4,537,271, Cl. 180-131.000.

Kubota, Shikibu, to Nissan Motor Company, Limited. Column shift type gear selector device for an automatic power transmission of an automotive vehicle. 4,537,088, Cl. 74-473.0SW.

Kudo, Yoshiaki: *See*—
Mori, Shigeru; Kudo, Yoshiaki; and Kuwata, Satoshi, 4,537,691, Cl. 252-49.600.

Kudo, Yoshihiko: *See*—
Abe, Shunichi; Akiyama, Mitsuo; and Kudo, Yoshihiko, 4,538,231, Cl. 364-483.000.

Kuebker, William A.: *See*—
Morrow, Robert M.; Kuebker, William A.; and McGinity, James W., 4,537,689, Cl. 252-11.000.

Kuehl, Guenter H.: *See*—
Chu, Pochen; and Kuehl, Guenter H., 4,537,758, Cl. 423-329.000.

Kuhl, Henry Y. Horizontal flat destacker. 4,537,208, Cl. 134-124.000.

Kuhnert, Volker: *See*—
Wilhelm, Dieter; and Kuhnert, Volker, 4,538,090, Cl. 313-578.000.

Kulju, Sakari, to Valmet Oy. Grab harvester. 4,537,236, Cl. 144-336.000.

Kulkarni, Satish V.; Christensen, Richard M.; and Toland, Richard H., to United States of America, Energy. Matched metal die compression molded structural random fiber sheet molding compound flywheel. 4,537,091, Cl. 74-572.000.

Kume, Hiroshi, to Fuji Xerox Co., Ltd. Channel access system. 4,538,261, Cl. 370-85.000.

Kummer, Rudolf: *See*—
Schneider, Heinz-Walter; Richter, Wolfgang; Disteldorf, Walter; and Kummer, Rudolf, 4,537,987, Cl. 560-193.000.

Kunimi, Nobuo; Shimizu, Koichi; and Suzuki, Toshiro, to Hitachi, Ltd. Differential amplifier. 4,538,114, Cl. 330-253.000.

Kuno, Masao: *See*—
Suzuki, Akihiro; Souda, Keiichi; Kuno, Masao; and Ikuta, Hiroshi, 4,538,191, Cl. 360-88.000.

Kunzmann, Otto, to bielomatik Leuze GmbH & Co. Method and apparatus for aligning a pile of sheets provided with perforations for bindings. 4,537,545, Cl. 412-7.000.

Kuo, Chang-Kiang; and Tsaur, Shyh-Chang. Method of making high density dynamic memory cell. 4,536,941, Cl. 29-571.000.

Kuraray Co., Ltd.: *See*—
Kojima, Hidetaka; Horikawa, Takeshi; and Kagotani, Masahiro, 4,537,997, Cl. 568-454.000.
Omura, Ikuo; Yamauchi, Junichi; Nagase, Yoshinori; and Uemura, Fumiko, 4,537,940, Cl. 526-278.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Kawakami, Yukichika; Shiiki, Zenya; and Iizuka, Yo, 4,537,953, Cl. 528-388.000.

Kurematsu, Masayuki; and Koboshi, Shigeharu, to Konishiroku Photo Industry Co., Ltd. Method of processing silver halide color photographic materials. 4,537,856, Cl. 430-372.000.

Kuroda, Nobuyuki: *See*—
Matsuura, Kazuo; Shikatani, Yutaka; Kamiishi, Hirofumi; Kuroda, Nobuyuki; and Miyoshi, Mituji, 4,537,938, Cl. 526-97.000.

Kuroda, Toshio: *See*—
Nozawa, Koohei; Yoshizawa, Toyokichi; and Kuroda, Toshio, 4,537,967, Cl. 546-141.000.

Kuroki, Junsuke: *See*—
Ito, Hideo; Kuroki, Junsuke; and Irie, Namio, 4,537,420, Cl. 280-661.000.

Kuroume, Hirotsugu: *See*—
Mitamura, Sachio; and Kuroume, Hirotsugu, 4,537,538, Cl. 409-217.000.

Kuroyanagi, Masatoshi; and Suzuki, Masahiko, to Nippondenso Co., Ltd. Fuel injection device. 4,537,171, Cl. 123-449.000.

Kusch, Richard J. Neck exerciser. 4,537,393, Cl. 272-94.000.

Kushibiki, Keizou: *See*—
Matsuzaki, Yoshitomi; Hayashi, Toshihiko; and Kushibiki, Keizou, 4,537,159, Cl. 123-41.270.

Kuwakado, Satosi: *See*—
Tsuge, Noboru; Taguchi, Masahiro; Kato, Masanori; and Kuwakado, Satosi, 4,537,169, Cl. 123-325.000.

Kuwata, Satoshi: *See*—
Mori, Shigeru; Kudo, Yoshiaki; and Kuwata, Satoshi, 4,537,691, Cl. 252-49.600.

Kuyel, Birol, to AT&T Technologies, Inc. Photomask encapsulation. 4,537,813, Cl. 428-209.000.

Kuziemka, Edmund J., to Material Sciences Corporation. One step method of applying polysiloxane and PTFE coating composition. 4,537,800, Cl. 427-327.000.

Laarman, Timothy D.: *See*—
Nath, Prem; Hoffman, Kevin R.; and Laarman, Timothy D., 4,537,795, Cl. 427-39.000.

Laas, Harald: *See*—
Goetz, Norbert; Laas, Harald; Tavs, Peter; Hupfer, Leopold; and Baer, Karl, 4,538,009, Cl. 568-799.000.

Laboratoires Boiron: *See*—
Boiron, Jean; Boiron, Christian; Abecassis, Jacky; and Favier, Andre-Marcel, 4,537,512, Cl. 366-132.000.

Laclede Professional Products, Inc.: *See*—
Pellico, Michael A.; and Montgomery, Robert E., 4,537,764, Cl. 424-50.000.

LaFleur, Paul J., Jr.: *See*—
Groom, James S.; and LaFleur, Paul J., Jr., 4,537,012, Cl. 53-552.000.

L'Air Liquide, Societe Anonyme Pour L'Etude Et L'Exploitation Des Procedes Georges Claude: *See*—
Zumbrunn, Jean-Pierre; Levielle, Jean; Thomas, Andre ; and Grangette, Francoise, 4,536,907, Cl. 8-149.100.

Lakshmanan, Vaikuntam I.; and Biskupski, Jurgen K., to Ontario Research Foundation. Recovery of precious metals. 4,537,628, Cl. 75-118.00R.

Lallemand, Yves: *See*—
Lelle-Vedove, Daniel; Lallemand, Yves; and Hubert, Olivier, 4,537,201, Cl. 128-697.000.

Lamb Technicon Corp.: *See*—
Faitel, William M., 4,537,087, Cl. 74-394.000.

Landis, John M.: *See*—
Douty, George H.; Landis, John M.; and Snyder, Clair W., Jr., 4,537,454, Cl. 339-45.00M.

Landriault, L. Steven, to Hydril Company. Joint and joint components for pipe sections subjected to axial compression loads. 4,537,428, Cl. 285-333.000.

Landriault, L. Steven, to Hydril Company. Tubular connection with cylindrical and tapered stepped threads. 4,537,429, Cl. 285-334.000.

Lang, Gordon R.; Forney, George D., Jr.; Qureshi, Shahid; Longstaff, Fred M.; and Lee, Chi H., to ESE Limited. Signal structures with data encoding/decoding for QCM modulations. 4,538,284, Cl. 375-39.000.

Lang, Tibor: *See*—
Horvath, Istvan; Lang, Tibor; Pongo, Laszlo ; Reiter, Jozsef; Somorai, Tamas; Szilagyi, Geza; and Toldy, Lajos, 4,537,899, Cl. 514-384.000.

Lange, Arno; Merger, Franz; Hettinger, Peter; and Adolphi, Heinrich, to BASF Aktiengesellschaft. Insecticidal carbamates. 4,537,901, Cl. 514-404.000.

Lange, Ludwig: *See*—
Hinrichs, Walter; Hammer, Friedrich; and Lange, Ludwig, 4,536,938, Cl. 29-527.500.

Langen, Marinus J. M., to H. J. Langen & Sons Limited. Carton opening mechanism. 4,537,587, Cl. 493-315.000.

Langley, John G.: *See*—
Flesher, Peter; and Langley, John G., 4,537,513, Cl. 366-162.000.

LaRou, Albert M.; and Atteberry, Eldon A., to Emerson Electric Co. Shaft locking device for bearing assemblies. 4,537,519, Cl. 384-478.000.

Larsson, Gosta, to Jochnick & Norrman Press AB. Force pump. 4,537,568, Cl. 418-202.000.

Laser Precision Corporation: *See*—
Doyle, Walter M., 4,537,508, Cl. 356-346.000.

Lasser, George A., to Honeywell Inc. Dual input watchdog timer. 4,538,273, Cl. 371-62.000.

Lattanzi, Ettore. Process and plant for endless-cycle sterilization of sheet material utilized in aseptic packaging of pre-sterilized fluid products. 4,537,007, Cl. 53-425.000.

Lau, Kreisler S. Y., to Hughes Aircraft Company. Diethynylated phenylbenzimidazole compounds. 4,537,974, Cl. 548-328.000.

Lau, Patrick W.: *See*—
Chan, Lock-Lim; and Lau, Patrick W., 4,537,807, Cl. 428-74.000.

Lavene, Bernard, to Electronic Concepts, Inc. Means and method for fabricating planar terminated capacitors. 4,538,205, Cl. 361-308.000.

Lavie, Ram, to Technion Research and Development Foundation, Inc. Process for the manufacture of ammonia. 4,537,760, Cl. 423-359.000.

Lawhorn, William S.; and Clinkenbeard, Ivan L., to LTV Aerospace and Defense Company. Small caliber guided projectile. 4,537,371, Cl. 244-3.220.

Lawson, Douglas R.: *See*—
Varndell, Sydney A.; Lawson, Douglas R.; and Fountain, Michael W., 4,536,906, Cl. 5-468.000.

Lawson, Kenneth L., to Rain Bird Sprinkler Mfg. Corp. Drive assembly for a reaction drive sprinkler. 4,537,356, Cl. 239-230.000.

Lax, David R.; Page, Michael; and Johnstone, James S., to Schlumberger Electronics (U.K.) Limited. Apparatus for and method of random vibration control. 4,537,076, Cl. 73-662.000.

Lazcano-Navarro, Arturo; and Alcantara, Miguel A., to Instituto Mexicano de Investigaciones Siderurgicas. Method for obtaining high purity ductile iron. 4,537,629, Cl. 75-130.00R.

Lazes, Richard J. Pipe thread gauge. 4,536,964, Cl. 33-199.00R.

Lech, Thaddeus, Jr.; and Popchock, Richard T., to Alma Piston Company. Clutch driven plate assembly. 4,537,296, Cl. 192-106.200.

Lectron Products, Inc.: *See*—
Slavin, Michael; and Miller, Ellsworth S., 4,538,045, Cl. 219-91.210.

Lee, Arnold S. J. Multi-pressure manometer. 4,537,079, Cl. 73-747.000.

Lee, Chi H.: *See*—
Lang, Gordon R.; Forney, George D., Jr.; Qureshi, Shahid; Longstaff, Fred M.; and Lee, Chi H., 4,538,284, Cl. 375-39.000.

Lee, Pang K.; and Hickam, William M., to Westinghouse Electric Corp. Technique for monitoring the oxidation/reduction potential characteristics of a steam environment. 4,537,661, Cl. 204-1.00T.

Le Fur, Raphael: *See*—
Horodniceanu, Florian; and Le Fur, Raphael, 4,537,790, Cl. 427-2.000.

Leggett & Platt, Incorporated: *See*—
Whitehead, Larry W., 4,536,904, Cl. 5-201.000.

Lehr, Howard C.: *See*—
Brockway, Patrick H.; Lehr, Howard C.; and George, Richard D., 4,537,440, Cl. 296-108.000.

Lein, Juergen G.; and Robbins, Daniel H., to Itek Corporation. Heater-drier for fusing toner images on wet printing plates. 4,537,492, Cl. 355-3.0FU.

Lein, Wilfried: *See*—
Huschelrath, Gerhard; and Lein, Wilfried, 4,538,108, Cl. 324-232.000.

Leland Stanford Junior University, The Board of Trustees of the: *See*—
Barth, Phillip W., 4,537,680, Cl. 210-316.000.
Widrow, Bernard, 4,537,200, Cl. 128-696.000.

Lemaire, Francis: *See*—
Gaussens, Gilbert; and Lemaire, Francis, 4,537,668, Cl. 204-159.170.

Lemna Corporation, The: *See*—
Hogen, Delman R., 4,536,988, Cl. 47-1.500.

Lena, Richard M., to Wang Laboratories, Inc. Detector using delayed and undelayed inputs for demodulating FM or PM signals. 4,538,112, Cl. 329-145.000.

Lenhardt, Wilfred K., to Mobil Oil Corporation. Recording system for a borehole logging tool. 4,538,248, Cl. 367-25.000.

Lersmacher, Bernhard; Wassall, Michael P.; and Connor, Philip J. Atomizer for atomic absorption spectroscopy. 4,537,506, Cl. 356-312.000.

Les Cables de Lyon: *See*—
Degoix, Bernard; Boussemaer, Daniel; and Allemand, Didier, 4,537,468, Cl. 350-96.210.

Leuenberger, Claude-Eric: *See*—
Dinger, Rudolf; Michel, Jean-Georges; and Leuenberger, Claude-Eric, 4,537,515, Cl. 368-202.000.

Lever Brothers Company: *See*—
Dawson, Peter L., 4,537,604, Cl. 51-298.000.
Edge, David J.; Naik, Appaya R.; and Scott, Melvin, 4,537,709, Cl. 252-558.000.

Levielle, Jean: *See*—
Zumbrunn, Jean-Pierre; Levielle, Jean; Thomas, Andre ; and Grangette, Francoise, 4,536,907, Cl. 8-149.100.

Levin, Burton L.; Phelps, Andrew E.; and Potash, Hanan, to Burroughs Corporation. Address translation buffer. 4,538,241, Cl. 364-900.000.

Levine, Morris M., to CIC Int'l Corp. Wet-dry vacuum cleaner. 4,536,914, Cl. 15-344.000.

Lewandowski, Thomas: *See*—
Steere, Robert E., Jr.; and Lewandowski, Thomas, 4,537,177, Cl. 125-13.00R.

Lewis, Charles, Jr.: *See*—
Tolbert, William R.; Feder, Joseph; and Lewis, Charles, Jr., 4,537,860, Cl. 435-240.000.

Lewis, D. Michael: *See*—
Everman, Wayne F.; Lewis, D. Michael; and Russell, Raymond L., 4,537,584, Cl. 493-93.000.

Lewis, George A.; Collins, Kent L.; Benesh, Joseph C.; and Ward, Patrick C., to North American Philips Lighting Corp. High-pressure sodium lamp spring clip cross piece for electrode and end plug support. 4,538,091, Cl. 313-625.000.

Lewtas, Kenneth: *See*—
Rossi, Albert; and Lewtas, Kenneth, 4,537,602, Cl. 44-62.000.

L'Garde, Inc.: *See*—
Hirasuna, Alan R.; and Veal, Gordon R., 4,537,406, Cl. 277-1.000.

LGT Laboratoire General des Telecommunications: *See*—
Cluniat, Claude, 4,538,180, Cl. 358-186.000.

LGZ Landis & Gyr Zug AG: *See*—
Baltes, Heinrich P.; Glass, Andrew S.; and Jauch, Karl, 4,537,504, Cl. 356-71.000.

Li, Hsueh M., to Ethyl Corporation. Selective oligomer production. 4,537,755, Cl. 423-300.000.

Liang, Gao: *See*—
Ovshinsky, Stanford R.; Sapru, Krishna; and Liang, Gao, 4,537,674, Cl. 204-290.00R.

Liebman, Alan J.: *See*—
Durkee, David B.; and Liebman, Alan J., 4,538,156, Cl. 346-21.000.

Liepa, Alexander L., to Procter & Gamble Company, The. Control of particle size distribution during continuous heat-setting of meat analog. 4,537,783, Cl. 426-243.000.

Lin, Fan-Nan; and Pennella, Filippo, to Phillips Petroleum Company. Alcohol synthesis. 4,537,909, Cl. 518-713.000.

Lin, Hank S.: *See*—
Balbes, Michael S.; Day, Charles E.; Hooper, Robert L.; and Lin, Hank S., 4,538,175, Cl. 358-86.000.

Lin, Robert A.: *See*—
Cooke, Theodore M.; Lin, Robert A.; Whitfield, Richard G.; and Hock, Allan G., 4,537,631, Cl. 106-22.000.

Lin, Shiow C., to W. R. Grace & Co. Reactive plastisol dispersion. 4,537,805, Cl. 427-54.100.

Linaburg, Clyde P. Trailer hitch alignment device. 4,537,416, Cl. 280-478.00R.

Lincoln Laser Company: *See*—
Sherman, Randy J.; and Hanson, Derald F., 4,537,465, Cl. 350-68.000.

Lind, Leif I. Flow distributor. 4,537,118, Cl. 98-40.010.

Lindahl, Jonas A. I.; and Bergstrom, John R., to Mo och Domsjo Aktiebolag. Method for delignifying or bleaching cellulose pulp wherein chlorine is added to recycle liquor to regenerate chlorine dioxide. 4,537,656, Cl. 162-38.000.

Linde Aktiengesellschaft: *See*—
Weber, Gunter, 4,537,752, Cl. 423-224.000.

Linden, Enok S. R. Dental instrument for optimal positioning of an X-ray film support. 4,538,292, Cl. 378-169.000.

Lindmark, Malte; and Lindmark, Margareta. Pump. 4,537,562, Cl. 417-215.000.

Lindmark, Margareta: *See*—
Lindmark, Malte; and Lindmark, Margareta, 4,537,562, Cl. 417-215.000.

Lindstrom, Merlin R.: *See*—
Macdonell, Gary D.; Lindstrom, Merlin R.; Baldwin, Bernard A.; Louthan, Rector P.; and Schuettenberg, Alexander D., 4,537,690, Cl. 252-48.400.

Linstid, H. Clay, III; and Koermer, Gerald S., to Celanese Corporation. Isomerization of branched aldehydes to ketones. 4,537,995, Cl. 568-384.000.

Lion Corporation: *See*—
Morita, Hiroshi; Kawada, Yasuyuki; Yamada, Junichi; and Ukigai, Toshiyuki, 4,537,253, Cl. 166-274.000.

Lipp, Reinhold: *See*—
Achinger, Michael; Jaeger, Erhard; Lipp, Reinhold; and Streitenberger, Walter, 4,537,238, Cl. 164-169.000.

Liquid Carbonic Inc.: *See*—
Reed, Gordon A. D.; and Itzkovitch, Irwin J., 4,537,761, Cl. 423-644.000.

Lish, Charles A., to Standard Microsystems Corporation. Switched capacitor filter. 4,538,113, Cl. 330-126.000.

Little, Michael J.; Brown, Roger H.; Efron, Uzi; and Hoberg, Clarence P., to Hughes Aircraft Company. Optically flat semiconductor baseplate structure. 4,537,827, Cl. 428-409.000.

Little, Michael J.: *See*—
Grinberg, Jan; and Little, Michael J., 4,537,471, Cl. 350-333.000.

Liu, Chao-Min; and Westley, John, to Hoffmann-La Roche Inc. Antibiotics X-14889 A, C and D. 4,537,956, Cl. 536-1.100.

Liu, Dean-Yuan, to Sanders Associates, Inc. Plotter paper slitter. 4,537,582, Cl. 493-38.000.

Liu, Dirkson D. S., to Atomic Energy of Canada Limited. Multiple measuring control volume laser doppler anemometer. 4,537,503, Cl. 356-28.500.

Liu, Tung: *See*—
Tsang, Peter H.; Coyle, Joseph P.; Liu, Tung; and VanderPoorte, John G., 4,537,823, Cl. 428-308.400.

Lloyd, Robert H. F., to Conver Corporation. Vertical heat sink. 4,537,246, Cl. 165-80.00B.

LMT Radio Professionnelle: *See*—
Petitjean, Christian; and Marchand, Maurice, 4,538,148, Cl. 343-17.20R.

Lobdell, George H. Work holding stackable step stool. 4,537,282, Cl. 182-46.000.

Lockhart, Billy J. Combination hay hauler and stock trailer. 4,537,548, Cl. 414-24.500.

Lockwood, John J.: *See*—
Freige, Diab E.; Lockwood, John J.; Ramsay, Michael; and Keely, Leroy B., 4,538,073, Cl. 307-33.000.

Loczenski, Martin: *See*—
Barnicol-Ottler, Max; Loczenski, Martin; Mieschke, Norbert; Ott, Gerhard; Przybylski, Gerhard; and Weber, Dietmar, 4,538,022, Cl. 174-113.00R.

Logan, Ralph A.: *See*—
Henry, Charles H.; and Logan, Ralph A., 4,536,940, Cl. 29-569.00L.

Lohse, Friedrich; and Zondler, Helmut, to Ciba-Geigy Corporation. Curable mixtures containing epoxy resins and isomelamines. 4,537,946, Cl. 528-118.000.

Loizeau, Pierre, to Valeo. Torsional dampers. 4,537,298, Cl. 192-106.200.

Loizeau, Pierre, to Valeo. Torsional damper device. 4,537,579, Cl. 464-68.000.

Loizeau, Pierre; and Caray, Andre , to Valeo. Torsional damper device. 4,537,580, Cl. 464-68.000.

Long, David J.: *See*—
Oxenrider, Bryce C.; and Long, David J., 4,537,728, Cl. 260-455.00R.

Longstaff, Fred M.: *See*—
Lang, Gordon R.; Forney, George D., Jr.; Qureshi, Shahid; Longstaff, Fred M.; and Lee, Chi H., 4,538,284, Cl. 375-39.000.

Longuet, Michel: *See*—
Oberle, Patrick; Longuet, Michel; and Walker, David, 4,537,915, Cl. 521-84.100.

Lopiccolo, Jerome J. Adjustable water level device. 4,536,968, Cl. 33-367.000.

Lorenzen, Heinz-Christen; Heitmann, Uwe; Petersen, Kurt-Eckart; and Pinck, Peter, to Hauni-Werke Korber & Co. KG. Apparatus for perforating and testing the permeability of running webs of cigarette paper or the like. 4,537,206, Cl. 131-281.000.

Lorieux, Roland, to Thomson CSF. Transistor amplifier operating at ultra high frequency under pulse operating conditions. 4,538,118, Cl. 330-286.000.

Louth, Kenneth, to Ampex Corporation. Programmable non-linear speed control for a recording and/or reproducing apparatus. 4,538,190, Cl. 360-73.000.

Louthan, Rector P.: *See*—
Macdonell, Gary D.; Lindstrom, Merlin R.; Baldwin, Bernard A.; Louthan, Rector P.; and Schuettenberg, Alexander D., 4,537,690, Cl. 252-48.400.

Lowe, Barrie M.: *See*—
Casci, John L.; Lowe, Barrie M.; and Whittam, Thomas V., 4,537,754, Cl. 423-277.000.

Lowe, Henry E., Jr. Package of litter material for cats and other small animals. 4,537,148, Cl. 119-1.000.

Lown, Robert R.: *See*—
Gluckstern, Robert L.; Holsinger, Ronald F.; and Lown, Robert R., 4,538,130, Cl. 335-306.000.

LTV Aerospace and Defense Company: *See*—
Lawhorn, William S.; and Clinkenbeard, Ivan L., 4,537,371, Cl. 244-3.220.

Lu, Shih-Lai, to Minnesota Mining and Manufacturing Company. Tape closure for a can end. 4,537,327, Cl. 220-359.000.

Lubinsky, Anthony R.; Denton, Gary A.; Keller, Paul D.; and Williams, James E., to Xerox Corporation. Multi-roll development system. 4,537,494, Cl. 355-3.0DD.

Lucas Industries Limited: *See*—
Sharpe, Raymond; Griffiths, Trevor J.; and Hunt, Peter, 4,537,578, Cl. 464-31.000.

Lucas Industries, p.l.c.: *See*—
Skinner, Robert T. J., 4,537,359, Cl. 239-533.600.

Lucas, Robert L. Bookbinding device. 4,537,546, Cl. 412-10.000.

Luhrig, Hermann: *See*—
Boie, Immo; Luhrig, Hermann; and Kovacic, Guido, 4,537,486, Cl. 354-317.000.

Lundberg, Robert D.: *See*—
Agarwal, Pawan K.; and Lundberg, Robert D., 4,537,919, Cl. 523-336.000.
Peiffer, Dennis G.; Lundberg, Robert D.; and Pober, Kenneth W., 4,537,688, Cl. 252-8.50M.

Lundvall, Karl-Erik: *See*—
Stamvik, Anders R.; Kristensson, Sten K.; and Lundvall, Karl-Erik, 4,537,722, Cl. 260-397.400.

Lunsford, Carl D.; and Chen, Ying-Ho, to A. H. Robins Company, Inc. 1-Aryloxy-4-amino-2-butanols. 4,538,001, Cl. 568-633.000.

Luper, Charles R., to Sensormedics Corporation. Volume calibration syringe. 4,537,058, Cl. 73-1.00G.

Lupoli, Peter J., to Sun Chemical Corporation. Control circuit for locking mechanism of vehicle door. 4,537,049, Cl. 70-277.000.

Luxon, Bruce A., to General Electric Company. Polyphenylene ether blends containing electrostatically bound additive. 4,537,925, Cl. 524-151.000.

M.A.N.-Roland Druckmaschinen Aktiengesellschaft: *See*—
Theilacker, Klaus, 4,537,130, Cl. 101-425.000.

Maahs, Gunther: *See*—
Rombusch, Konrad; Maahs, Gunther; and Schafer, Wolfgang, 4,537,924, Cl. 524-103.000.

MacBain, John W. Rock reinforcement. 4,537,535, Cl. 405-260.000.

Macdonald, David I., to AT&T Technologies, Inc. Method of and apparatus for plating using controlled progressive immersion. 4,537,663, Cl. 204-14.100.

Macdonell, Gary D.; Lindstrom, Merlin R.; Baldwin, Bernard A.; Louthan, Rector P.; and Schuettenberg, Alexander D., to Phillips Petroleum Co. Aqueous metalworking composition containing 2-hydroxyethyl-(3-chloro-2-hydroxypropyl)sulfide. 4,537,690, Cl. 252-48.400.

Macerata, Alberto: *See*—
Mancini, Paolo; Taddei, Alessandro; Macerata, Alberto; and Marchesi, Carlo, 4,537,202, Cl. 128-712.000.

Machida, Kaoru, to Tokyo Shibaura Denki Kabushiki Kaisha. Abnormal cell detecting device. 4,537,203, Cl. 128-734.000.

Machinenfabrik Flums AG: *See*—
Benz, Gotlieb, 4,537,008, Cl. 53-438.000.

Mackowiak, Jerzy: *See*—
Billet, Reinhard; Kober, Rainer; Mackowiak, Jerzy; and Geipel, Werner, 4,537,731, Cl. 261-94.000.

Maconis, John, Jr.: *See*—
Adur, Ashok M.; Schmukler, Seymour; Maconis, John, Jr.; and Shida, Mitsuzo, 4,537,836, Cl. 428-522.000.

Macrander, Max S.: *See*—
Edwards, Ivan L.; and Macrander, Max S., 4,538,272, Cl. 371-61.000.

Maeda, Tetsuo: *See*—
Ando, Toshihiko; Ito, Norifumi; Matsubara, Tetsuyuki; Ichikawa, Kozo; Fukawa, Susumu; and Maeda, Tetsuo, 4,537,954, Cl. 528-481.000.

Maekawa, Toshikazu: *See*—
Soneda, Mitsuo; Maekawa, Toshikazu; and Otsu, Kouji, 4,538,288, Cl. 377-76.000.

Maeno, Fumio: *See*—
Shimizu, Masami; Yoshikawa, Hisao; Kimura, Sosaku; Shiba, Kazuo; Maeno, Fumio; Fuwa, Shigehiro; and Mihara, Kuniyuki, 4,536,993, Cl. 51-165.800.

Maeshima, Kaoru: *See*—
Takahashi, Takeo; Shimago, Kozo; and Maeshima, Kaoru, 4,537,973, Cl. 548-303.000.

Magar, Surendar S., to Texas Instruments Incorporated. High-speed multiplier for microcomputer used in digital signal processing system. 4,538,239, Cl. 364-759.000.

Magnetic Peripherals: *See*—
Hennenfent, Douglas J.; Holmstrand, Allan L.; and Kracke, Alan G., 4,536,992, Cl. 51-109.00R.

Magnetrol International, Incorporated: *See*—
DeMeyer, Roy W.; and Kozi, Martin F., 4,537,061, Cl. 73-290.00R.

Mahoney, Dennis F.; and Block, William V., to Economics Laboratory, Inc. Aqueous alkaline polyamine paint stripping compositions. 4,537,705, Cl. 252-529.000.

Maier, Siegfried; and Albrecht, Eckart, to Dupro AG. Cleaning apparatus. 4,537,424, Cl. 285-7.000.

Mainiero, Richard J., to United States of America, Interior. Non-incendive rock-breaking explosive charge. 4,537,133, Cl. 102-316.000.

Majumdar, Debesh: *See*—
Yourd, Raymond A., III; Majumdar, Debesh; and Gruber, Robert J., 4,537,848, Cl. 430-110.000.

Malish, Terrance J. Coupler device for floor maintenance pad or the like. 4,536,912. Cl. 15-230.170.

Malone, Edgar W., to Reynolds Industries, Inc. Spark gap device. 4,538,088, Cl. 313-325.000.

Manabe, Sakae, to AMP Incorporated. Electrical connector. 4,537,462, Cl. 339-259.00R.

Mancini, Paolo; Taddei, Alessandro; Macerata, Alberto; and Marchesi, Carlo, to Remco Italia S.p.A. Device for displaying electrical signals of the periodic and/or synchronizable type. 4,537,202, Cl. 128-712.000.

Manfredonia, Abe J.: *See*—
Inglett, Wilfred L., Jr.; Ashley, Walter M., Jr.; and Manfredonia, Abe J., 4,537,015, Cl. 53-386.000.

Mannesmann Demag Wean: *See*—
Jansen, Herbert; Schiffers, Hans-Gunter; and Gerretz, Richard, 4,537,407, Cl. 277-2.000.

Manning, David T., to Union Carbide Corporation. Herbicidal 2,6-dioxocyclohexylidene derivatives. 4,537,616, Cl. 71-92.000.

Manouvrier, Jean-Aime : *See*—
Buys, Romain J. B.; and Manouvrier, Jean-Aime , 4,537,796, Cl. 427-136.000.

Manville Service Corporation: *See*—
Ewing, Robert L.; Hughes, James S.; and Bruggeman, Bruce, 4,538,217, Cl. 362-375.000.

Manyai, Sandor: *See*—
Deak, Gyula; Zara nee Kaczian, Erzsebet; Gyorgy, Lajos; Fekete, Marton; Doda, Margit; Seregi, Andras; Kanyicska, Bela; Toth nee Pecsi, Erzsebet; Horvath nee Gaal, Maria; Manyai, Sandor; Gorgenyi, Frigyes; and Vaszovics nee Reichmann, Gyorgyi, 4,537,895, Cl. 514-307.000.

Marcantonio, Paul J., to Chevron Research Company. Treatment of alumina-base catalysts. 4,537,751, Cl. 423-114.000.

Marchand, Maurice: *See*—
Petitjean, Christian; and Marchand, Maurice, 4,538,148, Cl. 343-17.20R.

Marchesi, Carlo: *See*—
Mancini, Paolo; Taddei, Alessandro; Macerata, Alberto; and Marchesi, Carlo, 4,537,202, Cl. 128-712.000.

Mariani, Elio A.; Stern, Richard A.; and Babbitt, Richard W., to United States of America, Army. Dielectric waveguide bandpass apparatus. 4,538,123, Cl. 333-208.000.

Marie van Abeelen, Petrus C. A.: *See*—
Bussink, Jan; DeMunck, Johannes W. J.; and Marie van Abeelen, Petrus C. A., 4,537,930, Cl. 524-505.000.

Marker International: *See*—
Knabel, Walter R.; and Sedlmair, Gerhard J., 4,537,418, Cl. 280-605.000.

Markin, Charles: *See*—
Wiacek, Marian; Markin, Charles; and Book, Ronald J., 4,537,841, Cl. 429-56.000.

Markowsky, George: *See*—
Carter, John L.; Markowsky, George; and Wegman, Mark N., 4,538,240, Cl. 364-754.000.

Marritt, Clifford R.: *See*—
Dealto, Michael E.; DiGiacomo, Joseph D.; and Marritt, Clifford R., 4,537,104, Cl. 83-348.000.

Marsh, John D.; and Nazzer, Craig A., to Caterpillar Tractor Co. Stator for an electromagnetic machine. 4,538,086, Cl. 310-258.000.

Marsh, Richard O., Jr. Drive fit coupling for precast concrete piles. 4,537,534, Cl. 405-252.000.

Marshall, David: *See*—
Hawe, Malcolm; Marshall, David; and Walker, John R., 4,537,695, Cl. 252-70.000.

Martin, Harold B., Jr.: *See*—
Strange, Carl P.; Martin, Harold B., Jr.; and Tsang, Albert C., 4,537,958, Cl. 536-85.000.

Martin, Jessie A. Vehicle headlight attachment. 4,538,213, Cl. 362-61.000.

Maruyama, Katsuaki; Oishi, Yaichi; Noda, Norio; Terada, Takami; and Hyodo, Motoi, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Aisin Seiki Kabushiki Kaisha. Occupant's side holding device for the seat back of a seat. 4,537,444, Cl. 297-284.000.

Maschmeyer, Richard O., to Corning Glass Works. Fiducial surfaces. 4,537,473, Cl. 350-432.000.

Mashino, Zenichi: *See*—
Tajima, Hiroto; Kawakami, Hironori; Mashino, Zenichi; Hayami, Seinoshin; and Ohzeki, Osamu, 4,537,600, Cl. 44-51.000.

Massachusetts General Hospital: *See*—
Burroughs, Robert H.; Wright, John D.; Secunda, Jeffrey A.; and Newbower, Ronald S., 4,537,128, Cl. 101-407.0BP.

Masters, Richard M.: *See*—
Sharp, Harper E.; Spiegel, Leo; Masters, Richard M.; Frey, Elmer J.; Howatt, John R.; and Walker, Gary E., 4,537,067, Cl. 73-151.000.

Masuda, Jiro: *See*—
Tanigawa, Kou; Masuda, Jiro; Nakamura, Kazumasa; and Hayashi, Kazuhiko, 4,537,272, Cl. 180-176.000.

Masuda, Shunichi, to Canon Kabushiki Kaisha. Image recording apparatus. 4,537,497, Cl. 355-14.00R.

Material Sciences Corporation: *See*—
Kuziemka, Edmund J., 4,537,800, Cl. 427-327.000.

Mathias, William R.: *See*—
Bielinski, Ralph F.; Chacon, M. Frank; Kramer, Dennis M.; Mathias, William R.; and Schneider, Stanley, 4,538,199, Cl. 361-93.000.

Matsubara, Tetsuyuki: *See*—
Ando, Toshihiko; Ito, Norifumi; Matsubara, Tetsuyuki; Ichikawa, Kozo; Fukawa, Susumu; and Maeda, Tetsuo, 4,537,954, Cl. 528-481.000.

Matsuda, Shinpei: *See*—
Kato, Akira; Kamo, Tomoichi; Uno, Shigeo; Kawagoshi, Hiroshi; Yamashita, Hisao; and Matsuda, Shinpei, 4,537,873, Cl. 502-242.000.

Matsui, Isamu; and Mima, Hiroshi, to Murata Kikai Kabushiki Kaisha. Spliced joint of spun yarns. 4,537,019, Cl. 57-202.000.

Matsui, Mitsuo; and Matsumura, Teruyuki, to Fanuc Ltd. Method and apparatus for controlling electric discharge machine. 4,538,098, Cl. 318-567.000.

Matsui, Shinichi: *See*—
Kimura, Akira; Ishihama, Masao; Abe, Toshiro; Shimada, Kiyoshi; and Matsui, Shinichi, 4,537,275, Cl. 180-300.000.

Matsui, Takashi: *See*—
Shiino, Kouji; Hashimoto, Nobuo; Wada, Shozo; Nakamura, Keijiro; Izumi, Akio; Sato, Toshio; and Matsui, Takashi, 4,537,648, Cl. 156-351.000.

Matsumoto, Kazumasa: *See*—
Asano, Masao; Fujimatsu, Wataru; Matsumoto, Kazumasa; Murata, Hideki; Sato, Toshihiko; and Watanabe, Kenji, 4,537,824, Cl. 428-323.000.

Matsumura, Teruyuki: *See*—
Matsui, Mitsuo; and Matsumura, Teruyuki, 4,538,098, Cl. 318-567.000.

Matsumura, Yasushi: *See*—
Sugisawa, Ko; Matsumura, Yasushi; Taga, Kazumitsu; Sengoku, Kouji; and Nagatome, Yoshiaki, 4,537,789, Cl. 426-634.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Itoh, Yoshimasa; and Asakawa, Shiroh, 4,537,606, Cl. 55-158.000.
Otsuka, Hirotaka; Nakazato, Katsuo; Sannomiya, Kunio; Kawakami, Hidehiko; Tsuchiya, Hiroyoshi; and Uchida, Hideo, 4,538,184, Cl. 358-283.000.
Sadamatsu, Hideaki; Inoue, Michihiro; Kanda, Akihiro; and Matsuzawa, Akira, 4,536,950, Cl. 29-578.000.

Matsushita Graphic Communication Systems, Inc.: *See*—
Otsuka, Hirotaka; Nakazato, Katsuo; Sannomiya, Kunio; Kawakami, Hidehiko; Tsuchiya, Hiroyoshi; and Uchida, Hideo, 4,538,184, Cl. 358-283.000.

Matsuura, Ichiro; and Yamaguchi, Fumio, to Nippon Electric Glass Company, Ltd. Low temperature sealing composition. 4,537,863, Cl. 501-15.000.

Matsuura, Kazuo; Shikatani, Yutaka; Kamiishi, Hirofumi; Kuroda, Nobuyuki; and Miyoshi, Mituji, to Nippon Oil Company, Limited. Process for preparing polyolefins. 4,537,938, Cl. 526-97.000.

Matsuura, Masaaki: *See*—
Ajiki, Yoshio; and Matsuura, Masaaki, 4,537,164, Cl. 123-90.160.
Honda, Shoichi; Nakano, Yoshikatsu; Hirano, Makoto; and Matsuura, Masaaki, 4,537,165, Cl. 123-90.160.

Matsuzaki, Yoshitomi; Hayashi, Toshihiko; and Kushibiki, Keizou, to Nissan Motor Co., Ltd.; and Nihon Radiator Co., Ltd. Coolant reserve tank. 4,537,159, Cl. 123-41.270.

Matsuzawa, Akira: *See*—
Sadamatsu, Hideaki; Inoue, Michihiro; Kanda, Akihiro; and Matsuzawa, Akira, 4,536,950, Cl. 29-578.000.

Matteucci, John S.; Snyder, James K.; and Hahn, Robert E., to Optical Coating Laboratory, Inc. Flexible selective energy control sheet and assembly using the same. 4,536,998, Cl. 52-171.000.

Matula, Joseph J. Apparatus for dispensing viscous materials. 4,537,331, Cl. 222-165.000.

Maue, Dale N.: *See*—
Clark, Allen J.; and Maue, Dale N., 4,537,077, Cl. 73-665.000.

Mausezahl, Dieter: *See*—
Schaetzer, Harry; Raisin, Helmut; and Mausezahl, Dieter, 4,537,598, Cl. 8-641.000.

Max, John K. Flow metering circuit and method. 4,537,081, Cl. 73-861.770.

Mayer, Donald K., to Westinghouse Electric Corp. Combination refrigerant receiver, accumulator and heat exchanger. 4,537,045, Cl. 62-503.000.

Mayo, John H. Device and method to enable detection and measurement of deformities in well components. 4,537,069, Cl. 73-432.00R.

McCabe, Francis B. Adjustable tensioning device. 4,537,388, Cl. 254-232.000.

McCaig, John R., to McNold Corp. Quick release clamp for battery cable connector. 4,537,460, Cl. 339-235.000.

McCain Manufacturing Corporation: *See*—
McCain, William B.; and Higgins, George D., 4,537,342, Cl. 227-78.000.

McCain, William B.; and Higgins, George D., to McCain Manufacturing Corporation. Binding machine for a signature machine. 4,537,342, Cl. 227-78.000.

McCarty, Michael R.: *See*—
Gunda, Rajamouli; McCarty, Michael R.; and Rode, Melvin A., 4,537,029, Cl. 60-390.000.

McCleary, Donald J. Camper-trailer. 4,537,441, Cl. 296-181.000.

McCord, James W. Vapor generating and recovering apparatus. 4,537,660, Cl. 202-170.000.

McDaniel, Kenneth D., Jr.: *See*—
Endres, Douglas W.; McDaniel, Kenneth D., Jr.; and Griebel, Francis J., 4,537,281, Cl. 182-2.000.

McDaniel, Max P., to Phillips Petroleum Company. Tetravalent titanium treated calcined vanadium catalyst with trialkylaluminum cocatalyst. 4,537,869, Cl. 502-107.000.

McDaniel, Max P.: *See*—
Johnson, Marvin M.; and McDaniel, Max P., 4,537,928, Cl. 524-417.000.

McDonald, John: *See—*
Chang, Michael N.; Hammond, Milton L.; Jensen, Norman P.; McDonald, John; and Zambias, Robert A., 4,537,903, Cl. 514-456.000.
McDonnell, Roy E. Electrical control of body discharges and headaches. 4,537,195, Cl. 128-422.000.
McEathron, Eugene D., to PPG Industries, Inc. Stone trap and method of using for making glass fibers. 4,537,609, Cl. 65-1.000.
McFeaters, Earl: *See—*
Ang, T. Liem; Van Arnam, Donald; and McFeaters, Earl, 4,537,809, Cl. 428-41.000.
McGill, Leland S., to Kinney, Richard G. Toilet assemblies. 4,536,902, Cl. 4-476.000.
McGinity, James W.: *See—*
Morrow, Robert M.; Kuebker, William A.; and McGinity, James W., 4,537,689, Cl. 252-11.000.
McInnes, Robert. Apparatus for cleaning, plating and/or coating articles. 4,537,669, Cl. 204-201.000.
McKinnie, Bonnie G.; and Robinson, Gene C., to Ethyl Corporation. Alkanoyloxybenzenesulfonate salt production. 4,537,724, Cl. 260-400.000.
McMurtrey, David K. Bicycle handlebar stem. 4,537,525, Cl. 403-191.000.
McNesby, John B.; and Krys, Joseph F., to GTE Communications Products Corporation. Data rate conversion and supervisory bit insertion in a data system. 4,538,286, Cl. 375-112.000.
McNold Corp.: *See—*
McCaig, John R., 4,537,460, Cl. 339-235.000.
McNulty, Frank E. Conduit having waterproof layer of uniform thickness and method of manufacture. 4,537,225, Cl. 138-145.000.
Mead Corporation, The: *See—*
Jones, David E., 4,538,157, Cl. 346-75.000.
Mead Johnson & Company: *See—*
Alexander, Robert L.; Bequette, Robert J.; Kensler, Terry T.; and Scott, Joseph A., 4,537,883, Cl. 514-110.000.
Medical Technology, Ltd.: *See—*
Xanthopoulos, Piritheos E., 4,537,561, Cl. 417-63.000.
Meeks, Alan M. G., to ITW Limited. Security seals. 4,537,432, Cl. 292-318.000.
MegaTape Corporation: *See—*
Herrington, Lawrence; and Avra, Raymond E., 4,537,367, Cl. 242-198.000.
Meighen, Terrence: *See—*
Brennan, Robert J.; Meighen, Terrence; and Phillipson, Walter M., 4,537,459, Cl. 339-143.00R.
Meiko Industrial Co., Ltd.: *See—*
Neuhoff, Uredat, 4,537,445, Cl. 297-300.000.
Meise, William H.: *See—*
Dischert, Robert A.; and Meise, William H., 4,538,236, Cl. 364-574.000.
Melai, Henri A. I., to U.S. Philips Corporation. Variable frequency start circuit for discharge lamp with preheatable electrodes. 4,538,093, Cl. 315-219.000.
Meline, Harry R.; and Meyer, Richard A., to MTS Systems Corporation. Reference frame and hold-down support system for remote supported axial torsional extensometer. 4,537,082, Cl. 73-794.000.
Mendez, Emilio E.: *See—*
Chang, Chin-An; Chang, Leroy L.; Esaki, Leo; and Mendez, Emilio E., 4,538,165, Cl. 357-22.000.
Mens, Jacques M. N.: *See—*
Barnoin, Pierre; Mens, Jacques M. N.; and Merle, Gilbert, 4,537,374, Cl. 244-102.00R.
Mentor Corporation: *See—*
Fogarty, Terence M., 4,537,183, Cl. 128-79.000.
Mercer, James B. Therapeutic treatment for viral infections. 4,537,775, Cl. 514-398.000.
Mercier, Marc: *See—*
Toulhoat, Herve ; Plumail, Jean-Claude; Mercier, Marc; and Jacquin, Yves, 4,537,875, Cl. 502-314.000.
Merck & Co., Inc.: *See—*
Alexander, Jose; and Fix, Joseph A., 4,537,772, Cl. 514-9.000.
Chang, Michael N.; Hammond, Milton L.; Jensen, Norman P.; McDonald, John; and Zambias, Robert A., 4,537,903, Cl. 514-456.000.
Cragoe, Edward J., Jr.; Rooney, Clarence S.; and Williams, Haydn W. R., 4,537,902, Cl. 514-422.000.
Merck Frosst Canada, Inc.: *See—*
Belanger, Patrice C.; and Gillard, John W., 4,537,906, Cl. 514-532.000.
Merck Patent Gesellschaft mit beschrankter Haftung: *See—*
Bernhard, Horst; and Esselborn, Reiner, 4,537,636, Cl. 106-291.000.
Sucrow, Wolfgang; Schatull, Wolfgang; and Fuss, Peter, 4,537,698, Cl. 252-299.610.
Merck Sharp & Dohme (I.A.) Corp.: *See—*
Cragoe, Edward J., Jr.; Rooney, Clarence S.; and Williams, Haydn W. R., 4,537,902, Cl. 514-422.000.
Merger, Franz; Nestler, Gerhard; and Towae, Friedrich, to BASF Aktiengesellschaft. Preparation of carbamates. 4,537,960, Cl. 544-86.000.
Merger, Franz: *See—*
Lange, Arno; Merger, Franz; Hettinger, Peter; and Adolphi, Heinrich, 4,537,901, Cl. 514-404.000.
Merisinter S.p.A.: *See—*
Tosi, Riccardo, 4,536,958, Cl. 30-120.300.
Merle, Gilbert: *See—*
Barnoin, Pierre; Mens, Jacques M. N.; and Merle, Gilbert, 4,537,374, Cl. 244-102.00R.
Merlin Gerin: *See—*
Bardoux, Raymond; and Joffre, Henri, 4,538,071, Cl. 250-505.100.
Meseltron S. A.: *See—*
Degoumois, Michel, 4,536,961, Cl. 33-169.00R.
Messer Griesheim GmbH: *See—*
Volker, Wolfgang; and Glastra, Hendrik, 4,537,043, Cl. 62-239.000.
Messina, Elena R.: *See—*
Resnick, Brian J.; Messina, Elena R.; Bhatia, Madhukar; and Holmes, John G., 4,538,233, Cl. 364-513.000.
Methode Electronics Inc.: *See—*
Brown, Vincent B.; Kozel, Charles A.; Scheitz, John T.; and Armando, John E., 4,537,456, Cl. 339-99.00R.
Methods Engineering,Inc.: *See—*
Kennedy, Alvin B., III; Fontaine, Joseph S.; Kennard, Alfred J.; and Morrison, J. Bruce, 4,537,685, Cl. 210-709.000.
Metrick, Dennis: *See—*
Schortmann, Walter E.; and Metrick, Dennis, 4,537,819, Cl. 428-284.000.
Mettenleiter, Karl: *See—*
Storandt, Ralf; and Mettenleiter, Karl, 4,536,916, Cl. 16-48.500.
Meunier, Jean: *See—*
Eudier, Michel; Huret, Noel; and Meunier, Jean, 4,537,167, Cl. 123-193.00C.
Huret, Noel; and Meunier, Jean, 4,537,161, Cl. 123-41.710.
Meyer, Richard A.: *See—*
Meline, Harry R.; and Meyer, Richard A., 4,537,082, Cl. 73-794.000.
Meyer, Walter: *See—*
Kreisel, Rudolf; and Meyer, Walter, 4,537,640, Cl. 134-18.000.
Meyer, Willy; and Fory, Werner, to Ciba Geigy Corporation. N-Phenylsulfonyl-N'-triazinylureas. 4,537,619, Cl. 71-93.000.
Meyer, Willy: *See—*
Schurter, Rolf; Fory, Werner; and Meyer, Willy, 4,537,618, Cl. 71-92.000.
Meyer, Wolfgang: *See—*
Beckmann, Friedrich K.; Hoppe, Wolfgang; and Meyer, Wolfgang, 4,538,125, Cl. 333-248.000.
Miale, Joseph N.; and Chang, Clarence D., to Mobil Oil Corporation. Catalysis over activated zeolites. 4,538,014, Cl. 585-408.000.
Miale, Joseph N.; and Chang, Clarence D., to Mobil Oil Corporation. Catalysis over activated zeolites. 4,538,015, Cl. 585-408.000.
Miale, Joseph N.; and Chang, Clarence D., to Mobil Oil Corporation. Catalysis over activated zeolites. 4,538,016, Cl. 585-408.000.
Michael, Steven C.: *See—*
Fossett, Lawrence D.; and Michael, Steven C., 4,538,030, Cl. 179-7.1TP.
Michel, Jean-Georges: *See—*
Dinger, Rudolf; Michel, Jean-Georges; and Leuenberger, Claude-Eric, 4,537,515, Cl. 368-202.000.
Michel, Karl H.; and Kastner, Ralph E., to Eli Lilly and Company. A41030 antibiotics. 4,537,770, Cl. 424-118.000.
Michel, Karl H.: *See—*
Anderson, Marie T.; Michel, Karl H.; and Sands, Thomas H., 4,537,777, Cl. 514-521.000.
Boeck, LaVerne D.; Clem, Gladys M.; Hershberger, Charles L.; Anderson, Marie T.; and Michel, Karl H., 4,537,715, Cl. 260-112.50R.
Microdata Corporation: *See—*
Vahlstrom, Richard; and Keats, Dennis R., 4,538,223, Cl. 364-200.000.
Microdyne Corporation: *See—*
Balbes, Michael S.; Day, Charles E.; Hooper, Robert L.; and Lin, Hank S., 4,538,175, Cl. 358-86.000.
Middleton, Thomas R.: *See—*
Ditchek, Brian M.; and Middleton, Thomas R., 4,537,323, Cl. 220-2.10R.
Mieschke, Norbert: *See—*
Barnicol-Ottler, Max; Loczenski, Martin; Mieschke, Norbert; Ott, Gerhard; Przybylski, Gerhard; and Weber, Dietmar, 4,538,022, Cl. 174-113.00R.
Mihara, Kuniyuki: *See—*
Shimizu, Masami; Yoshikawa, Hisao; Kimura, Sosaku; Shiba, Kazuo; Maeno, Fumio; Fuwa, Shigehiro; and Mihara, Kuniyuki, 4,536,993, Cl. 1-165.800.
Miki, Yasuhiko, to Sony/Tektronix Corporation. Diagnostic apparatus for digital-to-analog converters. 4,538,266, Cl. 371-15.000.
Milili, Marc: *See—*
Fourche , Jean-Pierre; and Milili, Marc, 4,538,128, Cl. 335-210.000.
Milish, William P., to Transamerica Delaval Inc. Magnetically responsive circuit-element module for liquid-level monitoring and probe therefrom. 4,537,070, Cl. 73-313.000.
Milish, William P., to Transamerica DeLaval, Inc. Fluid-sampling valve for a hydraulic system. 4,537,219, Cl. 137-614.190.
Milkowski, Wolfgang: *See—*
Heinemann, Henning; Jasserand, Daniel; Milkowski, Wolfgang; Yavordios, Dimitri; and Zeugner, Horst, 4,537,975, Cl. 548-359.000.
Miller, Claude D.: *See—*
Day, Michael N.; and Miller, Claude D., 4,538,265, Cl. 371-12.000.
Miller, Dale D.; and Polky, John N., to Boeing Company, The. Multiple discrete frequency ranging with error detection and correction. 4,537,502, Cl. 356-5.000.

Miller, Ellsworth S.: *See—*
Slavin, Michael; and Miller, Ellsworth S., 4,538,045, Cl. 219-91.210.
Miller, James G.: *See—*
Drago, Russell S.; Miller, James G.; and Weiss, Keith D., 4,538,011, Cl. 570-240.000.
Miller, Ronald L.: *See—*
Silver, Howard F.; and Miller, Ronald L., 4,537,675, Cl. 208-8.0LE.
Miller, Stephen J., to Chevron Research Company. Oligomerization of liquid olefin over a nickel-containing silicaceous crystalline molecular sieve. 4,538,012, Cl. 585-255.000.
Miller, William R.: *See—*
Fisher, Kenneth J.; and Miller, William R., 4,538,214, Cl. 362-147.000.
Millet, Catherine; Ser, Jean-Claude; and N'Guyen, Quang L., to Societe Anonyme dite: L'Oreal. Emulsifying system based on a fatty acid or a protein condensate, a polyoxyethylenated sterol and a phosphatide, and a cosmetic or pharmaceutical composition containing the same. 4,537,782, Cl. 514-774.000.
Millhone, Ralph S.: *See—*
Elson, Thomas D.; and Millhone, Ralph S., 4,537,254, Cl. 166-278.000.
Mima, Hiroshi: *See—*
Matsui, Isamu; and Mima, Hiroshi, 4,537,019, Cl. 57-202.000.
Mimura, Yoshiyuki; Okada, Takao; and Toda, Akitoshi, to Olympus Optical Company Ltd. Multiconductive layer electrophotographic photosensitive device and method of manufacture thereof. 4,537,845, Cl. 430-58.000.
Mimura, Yoshiyuki; Okada, Takao; and Toda, Akitoshi, to Olympus Optical Company, Ltd. Multiconductive layer electrophotographic photosensitive device and method of manufacture thereof. 4,537,846, Cl. 430-58.000.
Minami, Kunihiko, to Sasakura Engineering Co., Ltd. Air-cooled heat exchanger. 4,537,248, Cl. 165-113.000.
Mine Safety Appliances Company: *See—*
Brinkhoff, Carl H.; and Scott, Gordon C., 4,536,892, Cl. 2-424.000.
Minichshofer, Klaus: *See—*
Feyerl, Gunther; Minichshofer, Klaus; and Pum, Hans G., 4,536,927, Cl. 28-110.000.
Ministry of International Trade and Industry: *See—*
Toraichi, Kazuo; Otsu, Nobuyuki; and Suzuki, Motomu, 4,538,227, Cl. 364-414.000.
Minnesota Mining and Manufacturing Company: *See—*
Brown-Wensley, Katherine A.; and Sinclair, Robert A., 4,537,942, Cl. 528-12.000.
Lu, Shih-Lai, 4,537,327, Cl. 220-359.000.
Minolta Camera Kabushiki Kaisha: *See—*
Taniguchi, Nobuyuki; Ishikawa, Norio; and Egawa, Takeshi, 4,537,487, Cl. 354-400.000.
Uchiyama, Tadamitsu, 4,538,160, Cl. 346-140.00R.
Ueda, Hiroshi; Saito, Mitsuru; and Kajita, Hideo, 4,537,732, Cl. 264-1.100.
Minor, John W. Solar heating and storage unit. 4,537,180, Cl. 126-437.000.
Mistral Windsurfing AG: *See—*
Gaide, Albert, 4,537,143, Cl. 114-39.000.
Mitamura, Sachio; and Kuroume, Hirotsugu, to Hitachi, Ltd. Apparatus for working on turbine blade mounting grooves. 4,537,538, Cl. 409-217.000.
Mitani, Ryo; Moriya, Yoshiaki; and Kobayashi, Atsushi, to Tokyo Shibaura Denki Kabushiki Kaisha. Data transfer control device. 4,538,145, Cl. 340-805.000.
Mitchell, Charles S.: *See—*
Dimmick, W. Scott; Mitchell, Charles S.; and Moon, William G., 4,538,193, Cl. 360-137.000.
Mitsubishi Chemical Industries Limited: *See—*
Ide, Hiroshi, 4,537,855, Cl. 430-285.000.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Fujiyama, Shigeo; and Ogata, Yasuhiro, 4,537,046, Cl. 62-505.000.
Hattori, Takatoshi, 4,536,954, Cl. 29-736.000.
Izaki, Katsura, 4,537,114, Cl. 98-2.060.
Kawaguchi, Susumu; and Morinushi, Ken, 4,537,567, Cl. 418-63.000.
Nakayama, Taesuke; and Konishi, Tadashi, 4,538,079, Cl. 310-74.000.
Niino, Shuhei; Ishimura, Koichi; Okamoto, Ken; and Ohba, Koichi, 4,537,051, Cl. 72-12.000.
Noda, Masahiro; and Ando, Hiroshi, 4,537,287, Cl. 187-29.00R.
Shinryo, Yuko; and Yamamoto, Takashi, 4,536,952, Cl. 29-596.000.
Tanaka, Toshinori, 4,538,085, Cl. 310-239.000.
Yamanaka, Takashi; Takeya, Yasushi; Yorita, Mitsumasa; Horiuchi, Toshiaki; Inagaki, Kouichi; Naya, Eizo; Demizu, Michinosuke; and Okumura, Mitsuhiro, 4,537,743, Cl. 419-38.000.
Mitsubishi Gas Chemical Company, Inc.: *See—*
Nakamura, Hiromi; Takahashi, Takehiko; Narazaki, Norio; Yamamoto, Kazuo; and Sayama, Norio, 4,537,023, Cl. 60-39.050.
Mitsui Engineering & Shipbuilding Co., Ltd.: *See—*
Yamato, Isao; and Yamada, Tominori, 4,537,564, Cl. 417-313.000.
Mitsui Toatsu Chemicals, Inc.: *See—*
Ando, Toshihiko; Ito, Norifumi; Matsubara, Tetsuyuki; Ichikawa, Kozo; Fukawa, Susumu; and Maeda, Tetsuo, 4,537,954, Cl. 528-481.000.
Mitutoyo Mfg. Co., Ltd.: *See—*
Yamamoto, Takeshi; and Sakata, Hideo, 4,536,963, Cl. 33-178.00E.
Miyake, Kazuo: *See—*
Ooshiro, Takehiko; Iwasaki, Masayoshi; Sahara, Kousuke; Suzuki, Norio; Utsumi, Hitoshi; Miyake, Kazuo; and Aburatani, Kenji, 4,537,073, Cl. 73-602.000.
Miyake, Toshio; and Hijiya, Hiromi, to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo. Products sweetened with α-glycosyl glycyrrhizin. 4,537,763, Cl. 424-49.000.
Miyako, Haruyoshi; and Arima, Kiyoteru, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Record. 4,538,258, Cl. 369-271.000.
Miyamura, Masataka; Sakamoto, Masanori; and Nakajima, Yuko, to Tokyo Shibaura Denki Kabushiki Kaisha. Electrochromic display element. 4,537,826, Cl. 428-328.000.
Miyano, Kenjiro: *See—*
Abraham, Bernard M.; Miyano, Kenjiro; and Ketterson, John B., 4,537,064, Cl. 73-54.000.
Miyatsuka, Hajime: *See—*
Kasuga, Akira; Yamamoto, Nobuyuki; and Miyatsuka, Hajime, 4,537,833, Cl. 428-328.000.
Miyawaki, Kunio: *See—*
Nakano, Teruo; Ohtani, Hideji; Miyawaki, Kunio; and Mogi, Shigeo, 4,538,047, Cl. 219-125.100.
Miyazawa, Shintaro: *See—*
Kawasaki, Akihisa; Tada, Kohji; Kotani, Toshihiro; and Miyazawa, Shintaro, 4,537,652, Cl. 156-617.0SP.
Miyoshi, Mituji: *See—*
Matsuura, Kazuo; Shikatani, Yutaka; Kamiishi, Hirofumi; Kuroda, Nobuyuki; and Miyoshi, Mituji, 4,537,938, Cl. 526-97.000.
Miyoshi, Motosuke; and Sano, Tetsuya, to Tokyo Shibaura Denki Kabushiki Kaisha. Stroboscopic scanning electron microscope. 4,538,065, Cl. 250-310.000.
Mo och Domsjo Aktiebolag: *See—*
Lindahl, Jonas A. I.; and Bergstrom, John R., 4,537,656, Cl. 162-38.000.
Mobay Chemical Corporation: *See—*
Ellis Margaret D.; Ferencz, Richard L.; and Kalz, Dietmar, 4,537,991, Cl. 564-133.000.
Mobil Oil Corporation: *See—*
Chu, Pochen; and Kuehl, Guenter H., 4,537,758, Cl. 423-329.000.
Horodysky, Andrew G.; and Herd, Richard S., 4,537,692, Cl. 252-49.600.
Horodysky, Andrew G., 4,537,694, Cl. 252-51.50A.
Lenhardt, Wilfred K., 4,538,248, Cl. 367-25.000.
Miale, Joseph N.; and Chang, Clarence D., 4,538,014, Cl. 585-408.000.
Miale, Joseph N.; and Chang, Clarence D., 4,538,015, Cl. 585-408.000.
Miale, Joseph N.; and Chang, Clarence D., 4,538,016, Cl. 585-408.000.
MoDo-Chemetics AB: *See—*
Henriksson, Sven-Erik D.; Ahrel, Bo A.; Svensson, Claes G. S.; and Franzen, Torsten A. H., 4,537,655, Cl. 162-23.000.
Mogi, Shigeo: *See—*
Nakano, Teruo; Ohtani, Hideji; Miyawaki, Kunio; and Mogi, Shigeo, 4,538,047, Cl. 219-125.100.
Mohr, Rudolf: *See—*
Oppenlaender, Knut; Fikentscher, Rolf; Buettner, Egon; Slotman, Wilhelmus; Schwartz, Erich; and Mohr, Rudolf, 4,537,701, Cl. 252-344.000.
Moisson, Marc F.; and Wisecarver, Martin L., to Raychem Corporation. Optical fiber chuck including a cover comprising an idler wheel and a V-shaped insert. 4,537,466, Cl. 350-96.200.
Mojden, Wallace W.; and Darr, Robert E., to Fleetwood Systems, Inc. Palletizing system. 4,537,010, Cl. 53-447.000.
Mojden, Wallace W.; and Darr, Robert E., to Fleetwood Systems, Inc. Automatic stack developing and loading system. 4,537,550, Cl. 414-46.000.
Molina, Domingo F. Double flapper check valve. 4,537,213, Cl. 137-269.500.
Molins, Ltd.: *See—*
Dealto, Michael E.; DiGiacomo, Joseph D.; and Marritt, Clifford R., 4,537,104, Cl. 83-348.000.
Monarch Knitting Machinery Corp.: *See—*
Gutschmit, Alan; and York, Paul W., 4,537,048, Cl. 66-93.000.
Monatex S.A.: *See—*
Gutschmit, Alan; and York, Paul W., 4,537,048, Cl. 66-93.000.
Moneta, Casimir, to J. I. Case Company. Steering wheel. 4,537,089, Cl. 74-493.000.
Monogram Industries, Inc.: *See—*
Pratt, John D.; and Ramirez, Raymond, 4,537,542, Cl. 411-55.000.
Monsanto Company: *See—*
Gomez, I. Luis, 4,537,828, Cl. 428-412.000.
Tolbert, William R.; Feder, Joseph; and Lewis, Charles, Jr., 4,537,860, Cl. 435-240.000.
Monsanto Europe, S.A.: *See—*
Underwood, John D., 4,537,060, Cl. 73-12.000.
Montage Computer Corporation: *See—*
Barker, Ronald C.; and Schuler, Chester L., 4,538,188, Cl. 360-14.300.
Montagna, Angelo A.: *See—*
Fiato, Rocco A.; Soled, Stuart L.; and Montagna, Angelo A., 4,537,867, Cl. 502-74.000.
Montant, Charles: *See—*
Pebeyre, Pierre-Jean; Gleyze, Rene ; and Montant, Charles, 4,537,613, Cl. 71-5.000.

Montedison S.p.A.: *See*—
Foa , Marco; Francalanci, Franco; Gardano, Andrea; and Bencini, Elena, 4,537,970, Cl. 546-319.000.

Montgomery, Gary V., to Sunbeam Plastics Corp. Dispensing closure lock and seal. 4,537,318, Cl. 215-232.000.

Montgomery, Robert E.: *See*—
Pellico, Michael A.; and Montgomery, Robert E., 4,537,764, Cl. 424-50.000.

Montgomery, Rodney L. Shelter. 4,537,210, Cl. 135-87.000.

Montgomery, William P., to Sprague Electric Company. Electrolytic capacitor. 4,538,212, Cl. 361-433.000.

Moon, Ronald R., to Quantum Corporation. Amplifier circuit. 4,538,099, Cl. 318-678.000.

Moon, William G.: *See*—
Dimmick, W. Scott; Mitchell, Charles S.; and Moon, William G., 4,538,193, Cl. 360-137.000.

Moore, Brian B., to International Business Machines Corporation. System for digitized voice and data with means to compensate for variable path delays. 4,538,259, Cl. 370-60.000.

Moore, Russell L.: *See*—
Bahr, Richard G.; and Moore, Russell L., 4,538,264, Cl. 371-8.000.

Moore, Thomas W.: *See*—
Coiner, Russell E.; and Moore, Thomas W., 4,537,463, Cl. 339-276.00A.

Moore, William M.: *See*—
Cawlfield, David W.; Moore, William M.; and Stubbs, John L., Jr., 4,537,937, Cl. 525-417.000.

Morawski, Janusz. Paint guard hand tool. 4,536,913, Cl. 15-257.00R.

Morehead, Clyde D. Protector for drink opening. 4,537,326, Cl. 220-269.000.

Morgan Construction Company: *See*—
Woodrow, Harold E.; and Smola, Raymond L., 4,537,055, Cl. 72-235.000.

Morgan, Robert H.: *See*—
Charney, Joseph C.; Goodman, Phillip M.; and Morgan, Robert H., 4,537,522, Cl. 401-218.000.

Morganstern, Kennard H., to Radiation Dynamics, Inc. Method for reducing the monomer content in acrylonitrile containing polymers. 4,537,734, Cl. 264-22.000.

Mori, Leo; Tominaga, Mamoru; and Aoba, Takashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Lighting apparatus. 4,538,216, Cl. 362-311.000.

Mori, Makoto: *See*—
Imanishi, Kazuo; Hashimoto, Masaru; and Mori, Makoto, 4,538,198, Cl. 361-86.000.

Mori, Masami: *See*—
Nishimura, Masao; Mori, Masami; and Yoshimi, Akirou, 4,537,245, Cl. 165-22.000.

Mori, Shigeru; Kudo, Yoshiaki; and Kuwata, Satoshi, to Shin-Etsu Chemical Co. Ltd. Silicone-based working fluid composition. 4,537,691, Cl. 252-49.600.

Mori, Takaaki: *See*—
Itoh, Toshiyasu; and Mori, Takaaki, 4,537,814, Cl. 428-217.000.

Morinushi, Ken: *See*—
Kawaguchi, Susumu; and Morinushi, Ken, 4,537,567, Cl. 418-63.000.

Morisawa, Kunio, to Toyota Jidosha Kabushiki Kaisha. Transverse type automatic transmission with through lay shaft. 4,537,092, Cl. 74-695.000.

Morisawa, Kunio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Hydraulic control system for automatic transmission. 4,537,095, Cl. 74-868.000.

Morison, John M., to Ferranti, plc. Automatic equipment. 4,538,177, Cl. 358-101.000.

Morita, Hiroshi; Kawada, Yasuyuki; Yamada, Junichi; and Ukigai, Toshiyuki, to Lion Corporation. Micellar slug for oil recovery. 4,537,253, Cl. 166-274.000.

Morita, Masao: *See*—
Yamamura, Kazuomi; Ishihara, Hideo; Iwamoto, Yoshinao; Sakaguchi, Hifumi; Morita, Masao; and Izawa, Toshio, 4,537,530, Cl. 405-160.000.

Moriya, Tatsuo, to Kabushiki Kaisha Suwa Seikosha. Multi-function analog display stopwatch. 4,537,514, Cl. 368-107.000.

Moriya, Yoshiaki: *See*—
Mitani, Ryo; Moriya, Yoshiaki; and Kobayashi, Atsushi, 4,538,145, Cl. 340-805.000.

Morris, Arnold M.; and Trivedi, Jitendra K., to Westinghouse Electric Corp. Elevator system. 4,537,286, Cl. 187-1.00A.

Morris, David; and Schwarz, Albrecht, to International Telephone and Telegraph Corporation. Multiwinding inductor and associated apparatus. 4,538,219, Cl. 363-26.000.

Morris, Dennis E., to National Semiconductor Corporation. Integrated circuit output pins used for input signals. 4,538,146, Cl. 340-814.000.

Morris, Harold D.: *See*—
Flanner, Philip D.; Morris, Harold D.; and Newell, Gerald R., 4,538,203, Cl. 361-159.000.

Morris, Robert L.: *See*—
Scotese, Anthony C.; Morris, Robert L.; Santilli, Arthur A.; and Strike, Donald P., 4,537,968, Cl. 546-209.000.

Morrison, J. Bruce: *See*—
Kennedy, Alvin B., III; Fontaine, Joseph S.; Kennard, Alfred J.; and Morrison, J. Bruce, 4,537,685, Cl. 210-709.000.

Morrison, Melvin M., to RCA Corporation. Planar microwave circuit component mounting system. 4,538,124, Cl. 333-246.000.

Morrow, Danny G.; and Oiwa, Thomas Y., to Raychem Corporation. Termination apparatus for heaters in hazardous environments. 4,538,053, Cl. 219-541.000.

Morrow, Robert M.; Kuebker, William A.; and McGinity, James W., to Board of Regents, University of Texas System, The. Oral lubricant for athletic mouth protector. 4,537,689, Cl. 252-11.000.

Mosley, William H., Jr.; and Andren, Carl F., to E-Systems, Inc. Coherent spread spectrum pseudonoise tracking loop. 4,538,280, Cl. 375-1.000.

Mosoiu, Marcel A.: *See*—
Borbely, Gyula J.; Devuyst, Eric A.; Ettel, Victor A.; Mosoiu, Marcel A.; and Schitka, Konstantin J., 4,537,686, Cl. 210-713.000.

Moss, Morris C.: *See*—
Scott, Tommy L.; and Moss, Morris C., 4,537,543, Cl. 411-371.000.

Mosser, Mark F., to Sermatech International, Inc. Spherical aluminum particles in coatings. 4,537,632, Cl. 106-14.120.

Motorola, Inc.: *See*—
Boothe, Nancy G.; and Potts, Anthony M., 4,536,925, Cl. 24-511.000.
Goodrich, Edgar R., Jr.; and Navratil, Philip, 4,538,270, Cl. 371-37.000.
Smith, William R.; and Myers, Theodore R., 4,538,169, Cl. 357-76.000.
Vyne, Robert L., 4,538,116, Cl. 330-271.000.

Moy, Debbie: *See*—
Gaffar, Abdul; Davis, Calvin B.; Donohue, John J.; and Moy, Debbie, 4,537,765, Cl. 424-53.000.

MTS Systems Corporation: *See*—
Christiansen, John A., 4,537,080, Cl. 73-857.000.
Clark, Allen J.; and Maue, Dale N., 4,537,077, Cl. 73-665.000.
Meline, Harry R.; and Meyer, Richard A., 4,537,082, Cl. 73-794.000.

Mugiya, Hiroshi: *See*—
Takagi, Masayuki; Mugiya, Hiroshi; and Komaju, Shigeru, 4,538,102, Cl. 323-349.000.

Muhlbauer, Ernst. Device and method for mixing liquid and powdery components, particularly for dental purposes. 4,537,303, Cl. 206-219.000.

Mulhaus, Ludwig: *See*—
Buxel, Ludwig M.; and Mulhaus, Ludwig, 4,537,571, Cl. 432-27.000.

Muller, Frank: *See*—
Schmid, Wolfgang; Wanner, Karl; Falchle, Jorg; Bleicher, Manfred; and Muller, Frank, 4,537,264, Cl. 173-48.000.

Muller, Hanns P.; and Schafer, Karl, to Bayer Aktiengesellschaft. Polyetheresters, their preparation, and their use for treating textiles. 4,537,596, Cl. 8-115.600.

Muller, Hans-Rudolf; and Bollinger, Heinrich, to Eprova Ag Forschungsinstitut. Process for the preparation of lower alkyl esters of N-L-α-aspartyl-L-phenylalanine and of new intermediates for their preparation. 4,537,714, Cl. 260-112.50R.

Muller, Reiner: *See*—
Hassler, Heinrich; Muller, Reiner; Kippenberg, Horst; and Prolss, Norbert, 4,537,745, Cl. 420-590.000.

Murakami, Shoetsu, to Yoshida Kogyo K.K. Separable slide fastener. 4,536,923, Cl. 24-433.000.

Muranaka, Yuuichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Ultrasonic diagnostic apparatus. 4,537,199, Cl. 128-660.000.

Muraoka, Masami: *See*—
Ono, Keiichi; Sugie, Akihiko; Muraoka, Masami; and Yamamoto, Michihiro, 4,537,989, Cl. 562-501.000.

Muraoka, Yasuhiko: *See*—
Umezawa, Hamao; Fujii, Akio; Muraoka, Yasuhiko; Nakatani, Tokuji; Fukuoka, Takeyo; and Takahashi, Katsutoshi, 4,537,880, Cl. 514-19.000.

Murase, Masakazu, to Terumo Kabushiki Kaisha. Electronic clinical thermometer. 4,537,518, Cl. 374-188.000.

Murata, Hideki: *See*—
Asano, Masao; Fujimatsu, Wataru; Matsumoto, Kazumasa; Murata, Hideki; Sato, Toshihiko; and Watanabe, Kenji, 4,537,824, Cl. 428-323.000.

Murata Kikai Kabushiki Kaisha: *See*—
Matsui, Isamu; and Mima, Hiroshi, 4,537,019, Cl. 57-202.000.

Murata Manufacturing Co., Ltd.: *See*—
Okabe, Shinsei; Komatsu, Hiroshi; Hamaji, Yukio; Kojima, Shozo; and Kato, Yoshiharu, 4,537,865, Cl. 501-135.000.

Murata, Shinichi: *See*—
Inomata, Koichiro; and Murata, Shinichi, 4,537,517, Cl. 374-21.000.

Murphy, Betty J.: *See*—
Smith, James A.; and Murphy, Betty J., 4,537,914, Cl. 521-111.000.

Murphy, William C.: *See*—
Brown, Patrick A.; and Murphy, William C., 4,537,285, Cl. 184-15.200.

Murray, Alexander P.; and Snyder, Thomas S., to Westinghouse Electric Corp. Decontamination using electrolysis. 4,537,666, Cl. 204-129.950.

Murray, Robert J., to Pennwalt Corporation. 1-(Aminobenzoyl)-1H-indazol-3-ols. 4,537,966, Cl. 546-120.000.

Muse, Joel, Jr.: *See*—
Colvin, Howard A.; Muse, Joel, Jr.; and Hollingshead, William S., 4,538,002, Cl. 568-650.000.

Musil, Frantisek: *See*—
Bursa, Miloslav; Musil, Frantisek; and Podmela, Ladislav, 4,537,094, Cl. 74-804.000.

Muti, Elliott J. Calipers arranged for remote reading. 4,536,960, Cl. 33-143.00M.

Muylle, Wilfried E., to AGFA-Gevaert N.V. Radiographic film package. 4,537,306, Cl. 206-455.000.

Myers, Theodore R.: *See—*
Smith, William R.; and Myers, Theodore R., 4,538,169, Cl. 357-76.000.

Naarden International N.V.: *See—*
van der Weerdt, Antonius J. A.; and Renes, Harrie, 4,537,702, Cl. 252-522.00R.

Nablo, Sam V., to Energy Sciences, Inc. Electron beam irradiating process for rendering rough or topographically irregular surface substrates smooth; and coated substrates produced thereby. 4,537,811, Cl. 428-166.000.

NACAM: *See—*
Haldric, Bernard, 4,537,523, Cl. 403-12.000.

Nagai, Isao: *See—*
Sato, Takahisa; Takata, Masahiro; Ueshima, Michio; and Nagai, Isao, 4,537,874, Cl. 502-311.000.

Nagasaka, Yasumasa, to Toyota Jidosha Kogyo Kabushiki Kaisha. Process of manufacturing auto bumpers. 4,536,937, Cl. 29-460.000.

Nagasawa, Masao, to Nippondenso Co., Ltd. Output supply control apparatus for internal combustion engine magneto generator. 4,537,174, Cl. 123-604.000.

Nagase, Yoshinori: *See—*
Omura, Ikuo; Yamauchi, Junichi; Nagase, Yoshinori; and Uemura, Fumiko, 4,537,940, Cl. 526-278.000.

Nagata, Masayuki: *See—*
Saito, Shigeo; and Nagata, Masayuki, 4,537,642, Cl. 148-11.50Q.

Nagatome, Yoshiaki: *See—*
Sugisawa, Ko; Matsumura, Yasushi; Taga, Kazumitsu; Sengoku, Kouji; and Nagatome, Yoshiaki, 4,537,789, Cl. 426-634.000.

Nagel, Rudolf: *See—*
Riexinger sen., Gustav; and Nagel, Rudolf, 4,536,929, Cl. 29-33.00K.

Naik, Appaya R.: *See—*
Edge, David J.; Naik, Appaya R.; and Scott, Melvin, 4,537,709, Cl. 252-558.000.

Naiman, Michael I., to Petrolite Corporation. Antistats containing acrylonitrile copolymers and polyamines. 4,537,601, Cl. 44-62.000.

Nakajima, Hirohito; Haji, Katsumi; Shibata, Yoji; and Kosuge, Wataru, to Hitachi, Ltd.; and Nippon Telegraph & Telephone Public Corporation. Buffer memory dispersion type video/audio transmission system. 4,538,176, Cl. 358-86.000.

Nakajima, Yuko: *See—*
Miyamura, Masataka; Sakamoto, Masanori; and Nakajima, Yuko, 4,537,826, Cl. 428-328.000.

Nakamura, Hidenori: *See—*
Shishikura, Toshikazu; Konuma, Hiroshi; Nakamura, Hidenori; and Kobayashi, Yukio, 4,537,843, Cl. 429-197.000.

Nakamura, Hiromi; Takahashi, Takehiko; Narazaki, Norio; Yamamoto, Kazuo; and Sayama, Norio, to Mitsubishi Gas Chemical Company, Inc. Regenerative gas turbine cycle. 4,537,023, Cl. 60-39.050.

Nakamura, Kazumasa: *See—*
Tanigawa, Kou; Masuda, Jiro; Nakamura, Kazumasa; and Hayashi, Kazuhiko, 4,537,272, Cl. 180-176.000.

Nakamura, Keijiro: *See—*
Shiino, Kouji; Hashimoto, Nobuo; Wada, Shozo; Nakamura, Keijiro; Izumi, Akio; Sato, Toshio; and Matsui, Takashi, 4,537,648, Cl. 156-351.000.

Nakamura, Motoharu: *See—*
Kitayama, Minoru; Nakamura, Motoharu; Hirose, Kikuji; and Tanida, Masashi, 4,537,792, Cl. 427-13.000.

Nakamura, Yasushi, to Tokyo Shibaura Denki Kabushiki Kaisha. Apparatus for detecting an abnormality in paperlike material. 4,538,290, Cl. 378-44.000.

Nakano, Kenichi: *See—*
Berenz, John J.; and Nakano, Kenichi, 4,537,654, Cl. 156-644.000.

Nakano, Motoo, to Fujitsu Limited. Semiconductor memory device. 4,538,166, Cl. 357-23.600.

Nakano, Teruo; Ohtani, Hideji; Miyawaki, Kunio; and Mogi, Shigeo, to Hitachi Zosen Corporation. Method of controlling robotic automatic welding apparatus. 4,538,047, Cl. 219-125.100.

Nakano, Yoshikatsu: *See—*
Honda, Shoichi; Nakano, Yoshikatsu; Hirano, Makoto; and Matsuura, Masaaki, 4,537,165, Cl. 123-90.160.

Nakatani, Tokuji: *See—*
Umezawa, Hamao; Fujii, Akio; Muraoka, Yasuhiko; Nakatani, Tokuji; Fukuoka, Takeyo; and Takahashi, Katsutoshi, 4,537,880, Cl. 514-19.000.

Nakayama, Hideo: *See—*
Tsutomu, Kimura; Nakayama, Hideo; and Fuseda, Yuichi, 4,538,179, Cl. 358-166.000.

Nakayama, Taesuke; and Konishi, Tadashi, to Mitsubishi Denki Kabushiki Kaisha. Flywheel device with compensation for non parallel plates. 4,538,079, Cl. 310-74.000.

Nakazato, Katsuo: *See—*
Otsuka, Hirotaka; Nakazato, Katsuo; Sannomiya, Kunio; Kawakami, Hidehiko; Tsuchiya, Hiroyoshi; and Uchida, Hideo, 4,538,184, Cl. 358-283.000.

Nangrani, Khemchand J., to Plastic Specialties and Technologies, Inc. High impact nylon composition. 4,537,929, Cl. 524-504.000.

Nanjo, Yusuke, to Sony Corporation. Retro-focus type wide angle lens. 4,537,476, Cl. 350-461.000.

Nanri, Shosuke; and Tsuchida, Kazuyoshi, to Toyo Boseki Kabushiki Kaisha. Three-layered fabric material. 4,537,822, Cl. 428-212.000.

Naramoto, Yuichi, to Aisin Seiki Kabushiki Kaisha. Vehicle body position control system. 4,537,411, Cl. 280-6.00R.

Narazaki, Norio: *See—*
Nakamura, Hiromi; Takahashi, Takehiko; Narazaki, Norio; Yamamoto, Kazuo; and Sayama, Norio, 4,537,023, Cl. 60-39.050.

Nassof, Martin, to Nassof, Martin. Air drape. 4,537,116, Cl. 98-36.000.

Nath, Prem; Hoffman, Kevin R.; and Laarman, Timothy D., to Sovonics Solar Systems. Method for introducing sweep gases into a glow discharge deposition apparatus. 4,537,795, Cl. 427-39.000.

National Distillers and Chemical Corporation: *See—*
Beimesch, Bruce J., 4,537,696, Cl. 252-75.000.

National Semiconductor Corporation: *See—*
Gray, Bruce; Soundaranathan, Kasivisvanatha; and VanGieson, Franklin D., 4,536,945, Cl. 29-571.000.
Morris, Dennis E., 4,538,146, Cl. 340-814.000.
Wang, Samuel T.; Hu, Chenming; and Shum, Ying, 4,538,246, Cl. 365-226.000.

Nau, Walter; and Carstensen, Jes, to Klockner-Humboldt-Deutz Aktiengesellschaft. Ballast weight arrrangement on agricultural prime movers. 4,537,423, Cl. 280-759.000.

Naumann, Klaus; Scheinpflug, Hans; Rosslenbroich, Hans-Jurgen; and Paul, Volker, to Bayer Aktiengesellschaft. Substituted benzoxazine derivatives and fungicidal use. 4,537,888, Cl. 514-228.000.

Navratil, Philip: *See—*
Goodrich, Edgar R., Jr.; and Navratil, Philip, 4,538,270, Cl. 371-37.000.

Naya, Eizo: *See—*
Yamanaka, Takashi; Takeya, Yasushi; Yorita, Mitsumasa; Horiuchi, Toshiaki; Inagaki, Kouichi; Naya, Eizo; Demizu, Michinosuke; and Okumura, Mitsuhiro, 4,537,743, Cl. 419-38.000.

Nazzer, Craig A.: *See—*
Marsh, John D.; and Nazzer, Craig A., 4,538,086, Cl. 310-258.000.

Neathway, Graham A.: *See—*
Benning, Gordon D.; Pascas, Brian J.; Blackhall, Robert K.; Wilker, Paul S.; and Neathway, Graham A., 4,538,031, Cl. 179-81.00B.

NEC Corporation: *See—*
Hori, Kiyoshi, 4,538,226, Cl. 364-200.000.
Yasue, Kazuo, 4,538,026, Cl. 178-2.00R.

Neely, James W.: *See—*
Isacoff, Eric G.; and Neely, James W., 4,537,683, Cl. 210-667.000.

Neimy, Daniel T.: *See—*
Seshadri, Jayaram; and Neimy, Daniel T., 4,537,047, Cl. 62-510.000.

Nemesnyik, John C., to Charles Beseler Company. Photographic contrast control device. 4,537,500, Cl. 355-67.000.

Nestler, Gerhard: *See—*
Merger, Franz; Nestler, Gerhard; and Towae, Friedrich, 4,537,960, Cl. 544-86.000.

Neturen Co., Ltd.: *See—*
Tanaka, Masaho; Shishido, Tomio; Fukuhara, Tetsukazu; Yao, Yugo; Kobayashi, Kunihilo; and Inoue, Yoshio, 4,538,042, Cl. 219-58.000.

Neuhoff, Uredat, to Meiko Industrial Co., Ltd. Chair. 4,537,445, Cl. 297-300.000.

Newbower, Ronald S.: *See—*
Burroughs, Robert H.; Wright, John D.; Secunda, Jeffrey A.; and Newbower, Ronald S., 4,537,128, Cl. 101-407.0BP.

Newell, Gerald R.: *See—*
Flanner, Philip D.; Morris, Harold D.; and Newell, Gerald R., 4,538,203, Cl. 361-159.000.

Neyer, Jean-Marie: *See—*
Bujadoux, Karel; and Neyer, Jean-Marie, 4,537,868, Cl. 502-104.000.

N'Guyen, Quang L.: *See—*
Millet, Catherine; Ser, Jean-Claude; and N'Guyen, Quang L., 4,537,782, Cl. 514-774.000.

Nguyen, Trung H.; and Hutchins, Clinton E., to Sprague Electric Company. Production of aluminum foil capacitor electrodes. 4,537,665, Cl. 204-29.000.

Nichols, Galen N.: *See—*
Taylor, Kevin D.; and Nichols, Galen N., 4,536,889, Cl. 2-160.000.

Nichols, Ralph A. Process for producing preserved fish food and fish food produced. 4,537,785, Cl. 426-332.000.

Nickerson, Harvey R.: *See—*
Press, Irving D.; Nickerson, Harvey R.; and Rink, Helm A., 4,537,425, Cl. 285-55.000.

Nicklas, Roger W.; Reynolds, John E.; and Schiestl, Randall L., to Honeywell Inc. Manufacture of projectiles. 4,536,928, Cl. 29-1.200.

Nicolai, Donald R.: *See—*
Hanson, Oliver D.; Nicolai, Donald R.; and Strong, Les O., 4,537,194, Cl. 128-399.000.

Nicoli, David F.: *See—*
Elings, Virgil B.; and Nicoli, David F., 4,537,861, Cl. 436-518.000.

Nicoll, Andrew R.: *See—*
Gross, Franz; Wahl, Georg; and Nicoll, Andrew R., 4,537,744, Cl. 420-446.000.

Nielsen, Steven T. Centrifuge tube having removable crown and swage fitting. 4,537,320, Cl. 215-276.000.

Nightingale, Douglas J., to Rolls-Royce Inc. Variable area nozzles for turbomachines. 4,537,026, Cl. 60-264.000.

Nihon Radiator Co., Ltd.: *See—*
Matsuzaki, Yoshitomi; Hayashi, Toshihiko; and Kushibiki, Keizou, 4,537,159, Cl. 123-41.270.

Niida, Hideo: *See—*
Denpou, Kazuo; Eto, Kazumi; and Niida, Hideo, 4,537,041, Cl. 62-199.000.

Niino, Shuhei; Ishimura, Koichi; Okamoto, Ken; and Ohba, Koichi, to Mitsubishi Denki Kabushiki Kaisha. Control device for successive rolling mill. 4,537,051, Cl. 72-12.000.
Nikaido, Tadanobu, to Nippon Telegraph & Telephone Public Corporation. Electronic time switch. 4,538,260, Cl. 370-66.000.
Nikka Chemical Industry Co., Ltd.: *See—*
Tajima, Hiroto; Kawakami, Hironori; Mashino, Zenichi; Hayami, Seinoshin; and Ohzeki, Osamu, 4,537,600, Cl. 44-51.000.
Nils Weibull AB: *See—*
Andersson, Sven A., 4,537,553, Cl. 414-302.000.
Nilssen, Ole K. Series-resonant electronic ballast circuit. 4,538,095, Cl. 315-244.000.
Nippon Chemi-Con Corporation: *See—*
Shimpo, Tetsuhiko; and Fujihata, Isao, 4,538,101, Cl. 323-272.000.
Nippon Electric Co., Ltd.: *See—*
Hatakeyama, Kenichi; and Inui, Tetsuji, 4,538,151, Cl. 343-18.00A.
Sone, Junichi, 4,538,077, Cl. 307-476.000.
Nippon Electric Glass Company, Ltd.: *See—*
Matsuura, Ichiro; and Yamaguchi, Fumio, 4,537,863, Cl. 501-15.000.
Nippon Kogaku K.K.: *See—*
Kakizaki, Yukio; Izawa, Hisao; and Hazama, Junji, 4,537,501, Cl. 355-76.000.
Terui, Nobuhiko, 4,537,488, Cl. 354-402.000.
Nippon Oil Company, Limited: *See—*
Matsuura, Kazuo; Shikatani, Yutaka; Kamiishi, Hirofumi; Kuroda, Nobuyuki; and Miyoshi, Mituji, 4,537,938, Cl. 526-97.000.
Ohmori, Tadashi; Fujiso, Tokuo; Yasui, Eiji; Nomura, Soichi; and Aizawa, Yukio, 4,537,872, Cl. 502-230.000.
Nippon Seiko Kabushiki Kaisha: *See—*
Okoshi, Hideo, 4,537,086, Cl. 74-201.000.
Nippon Shokubai Kagaku Kogyo Co Ltd: *See—*
Sato, Takahisa; Takata, Masahiro; Ueshima, Michio; and Nagai, Isao, 4,537,874, Cl. 502-311.000.
Nippon Soken, Inc.: *See—*
Kanehara, Kenji; Kohama, Tokio; Kawai, Hisasi; and Tokura, Norihito, 4,537,172, Cl. 123-527.000.
Ootsuka, Yoshinori; Hattori, Tadashi; Yamamoto, Minoru; and Ozaki, Tadashi, 4,537,065, Cl. 73-117.300.
Tsuge, Noboru; Taguchi, Masahiro; Kato, Masanori; and Kuwakado, Satosi, 4,537,169, Cl. 123-325.000.
Nippon Steel Corporation: *See—*
Kitayama, Minoru; Nakamura, Motoharu; Hirose, Kikuji; and Tanida, Masashi, 4,537,792, Cl. 427-13.000.
Tominaga, Jiro; Yada, Hiroshi; and Honda, Mitsuo, 4,537,644, Cl. 148-36.000.
Nippon Telegraph & Telephone Public Corporation: *See—*
Honda, Masaaki; Itakura, Fumitada; and Kitawaki, Nobuhiko, 4,538,234, Cl. 364-513.500.
Kawasaki, Akihisa; Tada, Kohji; Kotani, Toshihiro; and Miyazawa, Shintaro, 4,537,652, Cl. 156-617.0SP.
Nakajima, Hirohito; Haji, Katsumi; Shibata, Yoji; and Kosuge, Wataru, 4,538,176, Cl. 358-86.000.
Nikaido, Tadanobu, 4,538,260, Cl. 370-66.000.
Taga, Tokio, 4,538,153, Cl. 343-700.0MS.
Yoshino, Hideo; Arai, Eisuke; and Kiuchi, Kazuhide, 4,538,167, Cl. 357-59.000.
Nippondenso Co., Ltd.: *See—*
Kato, Masaaki; and Akashi, Tetsuji, 4,537,352, Cl. 239-90.000.
Kuroyanagi, Masatoshi; and Suzuki, Masahiko, 4,537,171, Cl. 123-449.000.
Nagasawa, Masao, 4,537,174, Cl. 123-604.000.
Nishi, Yasuyuki; Sakurai, Masao; and Takagi, Masashi, 4,537,042, Cl. 62-208.000.
Nishimura, Masao; Mori, Masami; and Yoshimi, Akirou, 4,537,245, Cl. 165-22.000.
Ootsuka, Yoshinori; Hattori, Tadashi; Yamamoto, Minoru; and Ozaki, Tadashi, 4,537,065, Cl. 73-117.300.
Sakai, Toshiyasu; Hara, Masahiro; and Teraura, Nobuyuki, 4,538,060, Cl. 235-472.000.
Suzuki, Akihiro; Souda, Keiichi; Kuno, Masao; and Ikuta, Hiroshi, 4,538,191, Cl. 360-88.000.
Nishi, Yasuyuki; Sakurai, Masao; and Takagi, Masashi, to Nippondenso Co., Ltd. Automotive refrigeration system. 4,537,042, Cl. 62-208.000.
Nishikawa, Masayasu: *See—*
Kimura, Kenji; and Nishikawa, Masayasu, 4,537,166, Cl. 123-90.360.
Nishikimi, Tadashi: *See—*
Hashiba, Isao; Nishikimi, Tadashi; and Tsuchiya, Shuji, 4,537,984, Cl. 560-061.000.
Nishimatsu, Masaharu: *See—*
Kohmoto, Osamu; Takasugi, Yasufumi; Sugihara, Hiroshi; and Nishimatsu, Masaharu, 4,537,832, Cl. 428-216.000.
Nishimura, Masao; Mori, Masami; and Yoshimi, Akirou, to Nippondenso Co., Ltd. Zone air-conditioning control system for motor vehicle compartment. 4,537,245, Cl. 165-22.000.
Nishioka, Itsuo: *See—*
Kooda, Akihide; Nishioka, Itsuo; Nishiyori, Takeshi; and Yahara, Shoji, 4,537,996, Cl. 568-442.000.
Nishiyori, Takeshi: *See—*
Kooda, Akihide; Nishioka, Itsuo; Nishiyori, Takeshi; and Yahara, Shoji, 4,537,996, Cl. 568-442.000.
Nishizawa, Junichi; Suzuki, Sobei; and Tamamushi, Takashige, to Nishizawa, Junichi. Method for fabricating semiconductor photodetector. 4,536,946, Cl. 29-571.000.
Nishizawa, Kazuo: *See—*
Hiyama, Torao; and Nishizawa, Kazuo, 4,538,132, Cl. 336-221.000.
Nissan Chemical Industries Ltd.: *See—*
Hashiba, Isao; Nishikimi, Tadashi; and Tsuchiya, Shuji, 4,537,984, Cl. 560-061.000.
Nissan Motor Co., Ltd.: *See—*
Gotoh; Miyuki, 4,537,226, Cl. 139-100.000.
Ito, Hideo; Kuroki, Junsuke; and Irie, Namio, 4,537,420, Cl. 280-661.000.
Kimura, Akira; Ishihama, Masao; Abe, Toshiro; Shimada, Kiyoshi; and Matsui, Shinichi, 4,537,275, Cl. 180-300.000.
Kubota, Shikibu, 4,537,088, Cl. 74-473.0SW.
Matsuzaki, Yoshitomi; Hayashi, Toshihiko; and Kushibiki, Keizou, 4,537,159, Cl. 123-41.270.
Noso, Kazunori; and Kishi, Norimasa, 4,538,295, Cl. 381-43.000.
Okada, Makoto; and Fujita, Kazunori, 4,537,278, Cl. 181-227.000.
Otani, Syuichi, 4,537,439, Cl. 296-37.900.
Nittan Company, Limited: *See—*
Kimura, Tetsuo, 4,538,137, Cl. 340-512.000.
Nivin, James E., to American Commercial Barge Line Co. Plastic sheet barge hatch cover. 4,537,147, Cl. 114-201.00R.
NLB Corp.: *See—*
Shook, Forrest A., 4,537,639, Cl. 134-10.000.
Noburu Onuki: *See—*
Sunada, Imao, 4,537,573, Cl. 433-32.000.
Noda, Masahiro; and Ando, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for detecting abnormality in the cage of an elevator. 4,537,287, Cl. 187-29.00R.
Noda, Norio: *See—*
Maruyama, Katsuaki; Oishi, Yaichi; Noda, Norio; Terada, Takami; and Hyodo, Motoi, 4,537,444, Cl. 297-284.000.
Noll, Brian J.: *See—*
Noll, Robert W.; and Noll, Brian J., 4,537,347, Cl. 236-49.000.
Noll, Robert W.; and Noll, Brian J. Bi-directional air diffuser. 4,537,347, Cl. 236-49.000.
Nomura, Soichi: *See—*
Ohmori, Tadashi; Fujiso, Tokuo; Yasui, Eiji; Nomura, Soichi; and Aizawa, Yukio, 4,537,872, Cl. 502-230.000.
Nomura, Takeo: *See—*
Shimizu, Masaki; Sudo, Tadashi; and Nomura, Takeo, 4,537,774, Cl. 424-195.100.
Nonogaki, Saburo; Hayashi, Nobuaki; and Tomita, Yoshifumi, to Hitachi, Ltd. Process of forming powder pattern using positive diazonium salt photoresist. 4,537,851, Cl. 430-144.000.
Noonan, Carroll: *See—*
Gale, Ronald S.; Bristol, William E.; and Noonan, Carroll, 4,537,586, Cl. 493-220.000.
Norem, Stanley D.: *See—*
Hill, Harold I.; Norem, Stanley D.; and Targowski, Roger, 4,537,572, Cl. 432-55.000.
Norfleet, James: *See—*
Clipper, Donald; and Norfleet, James, 4,537,778, Cl. 424-53.000.
Normalair-Garrett (Holdings) Limited: *See—*
Rogers, Brian H.; and Tucker, Paul A., 4,537,607, Cl. 55-163.000.
Norman, Rodric H. Continuous heat sealer for sacks and bags in thermoplastic material. 4,537,585, Cl. 493-205.000.
Norris, Claude R. Free-running rotary induction system. 4,537,173, Cl. 123-592.000.
Norris, George W.: *See—*
Wilhelm, John J.; Kapoor, Anoop; Kobuck, Richard M.; Antol, Ronald F.; and Norris, George W., 4,537,711, Cl. 252-633.000.
North American Philips Corporation: *See—*
Fitzpatrick, Brian J., 4,538,089, Cl. 313-478.000.
North American Philips Lighting Corp.: *See—*
Lewis, George A.; Collins, Kent L.; Benesh, Joseph C.; and Ward, Patrick C., 4,538,091, Cl. 313-625.000.
Norton, Thomas E., Sr. Shelf lowering and vial stoppering freeze-drying apparatus. 4,536,972, Cl. 34-92.000.
Norton, William W., to Culligan International Company. Tank lining system. 4,537,329, Cl. 220-465.000.
Nortronics Company, Inc.: *See—*
Kronfeld, Leonard E., 4,537,509, Cl. 356-399.000.
Noso, Kazunori; and Kishi, Norimasa, to Nissan Motor Company, Limited. Speech recognition system for an automotive vehicle. 4,538,295, Cl. 381-43.000.
Novacek, William G., to Sprague Electric Company. Method for continuously monitoring oxide thickness on moving aluminum foil. 4,537,664, Cl. 204-28.000.
Nowak, Alfred: *See—*
Koroncai, Adam; Nowak, Alfred; and Piber, Herbert, 4,536,956, Cl. 30-43.920.
Nowobilski, Jeffert J.; and Owens, William J., to Union Carbide Corporation. Insulation board and process of making. 4,537,820, Cl. 428-285.000.
Nozawa, Koohei; Yoshizawa, Toyokichi; and Kuroda, Toshio, to Wakamoto Pharmaceutical Co., Ltd. 1-Oxo-1,2,3,4-tetrahydro-3-isoquinoline carboxylic acid derivatives. 4,537,967, Cl. 546-141.000.
Nozawa, Yoshikuni, to Entac Company, Limited. Rotor/stator winding and method and apparatus for producing same. 4,538,083, Cl. 310-198.000.
NUKEM GmbH: *See—*
Huschelrath, Gerhard; and Lein, Wilfried, 4,538,108, Cl. 324-232.000.
Numminen, Matti: *See—*
Juhola, Mauno O.; and Numminen, Matti, 4,537,527, Cl. 405-50.000.

Nusbaum, Ronnie W. Combination car seat and stroller. 4,537,414, Cl. 280-47.410.
Oakley, Raymond E.: *See—*
Rhodes, Stephen J.; and Oakley, Raymond E., 4,536,951, Cl. 29-589.000.
Obara, Heitaro: *See—*
Ogawa, Tetsuya; Saitoh, Shinichi; Inoi, Takeshi; Kato, Masaji; and Obara, Heitaro, 4,537,999, Cl. 568-584.000.
Oberle, Patrick; Longuet, Michel; and Walker, David, to Polysar International S.A. Char resistant foams. 4,537,915, Cl. 521-84.100.
Occidental Chemical Corporation: *See—*
Walker, Leigh E.; and Ranade, Gautam R., 4,537,933, Cl. 525-71.000.
Ochiai, Kuniaki; and Komakine, Shigeo, to Tokyo Electric Co., Ltd. Dot printer head with reduced magnetic interference. 4,537,520, Cl. 400-124.000.
Ockelmann, Dieter: *See—*
Groll, Manfred; and Ockelmann, Dieter, 4,537,721, Cl. 260-242.200.
O'Connor, Martin F.: *See—*
Emeterio, Eloy V.; Deallenbach, Robert E.; O'Connor, Martin F.; and Klufas, Oleg, 4,537,560, Cl. 416-198.00A.
Ogata, Yasuhiro: *See—*
Fujiyama, Shigeo; and Ogata, Yasuhiro, 4,537,046, Cl. 62-505.000.
Ogawa, Tetsuo, to Katsuhiko Ohki. Ram pumps. 4,537,563, Cl. 417-226.000.
Ogawa, Tetsuya; Saitoh, Shinichi; Inoi, Takeshi; Kato, Masaji; and Obara, Heitaro, to Chisso Corporation; and Kaken Pharmaceutical Co., Ltd. Process for a production of dinitrophenyl ethers. 4,537,999, Cl. 568-584.000.
Ogo, Yoshimasa: *See—*
Tamura, Kaoru; and Ogo, Yoshimasa, 4,538,294, Cl. 378-187.000.
Ogunbiyi, Lai; Scott, Francis L.; and Smith, Francis X., to Bausch & Lomb Incorporated. Methods for disinfecting and preserving contact lenses. 4,537,746, Cl. 422-28.000.
Oh, Se-Kyung, to Boston University, Trustees of. Non-specific suppressive factors and process. 4,537,712, Cl. 260-112.00R.
Ohashi, Azusa: *See—*
Ohba, Hisao; Uchida, Toshio; Ohashi, Azusa; and Kita, Nobuyuki, 4,537,496, Cl. 355-10.000.
Ohba, Hisao; Uchida, Toshio; Ohashi, Azusa; and Kita, Nobuyuki, to Fuji Photo Film Company, Limited. Method of replenishing a developer for photosensitive plate. 4,537,496, Cl. 355-10.000.
Ohba, Koichi: *See—*
Niino, Shuhei; Ishimura, Koichi; Okamoto, Ken; and Ohba, Koichi, 4,537,051, Cl. 72-12.000.
Ohio State University: *See—*
Horton, Derek; and Priebe, Waldemar, 4,537,882, Cl. 514-34.000.
Ohmori, Tadashi; Fujiso, Tokuo; Yasui, Eiji; Nomura, Soichi; and Aizawa, Yukio, to Nippon Oil Company, Limited. Process for preparing a hydrocarbon reforming catalyst. 4,537,872, Cl. 502-230.000.
Ohsawa, Zenichi: *See—*
Yano, Yasuhiro; Umino, Isamu; Ohsawa, Zenichi; and Ozaki, Takayuki, 4,538,121, Cl. 331-25.000.
Ohtani, Hideji: *See—*
Nakano, Teruo; Ohtani, Hideji; Miyawaki, Kunio; and Mogi, Shigeo, 4,538,047, Cl. 219-125.100.
Ohzeki, Osamu: *See—*
Tajima, Hiroto; Kawakami, Hironori; Mashino, Zenichi; Hayami, Seinoshin; and Ohzeki, Osamu, 4,537,600, Cl. 44-51.000.
Oishi, Yaichi: *See—*
Maruyama, Katsuaki; Oishi, Yaichi; Noda, Norio; Terada, Takami; and Hyodo, Motoi, 4,537,444, Cl. 297-284.000.
Oiwa, Thomas Y.: *See—*
Morrow, Danny G.; and Oiwa, Thomas Y., 4,538,053, Cl. 219-541.000.
Okabe, Shinsei; Komatsu, Hiroshi; Hamaji, Yukio; Kojima, Shozo; and Kato, Yoshiharu, to Murata Manufacturing Co., Ltd. Process for preparing a particulate ceramic material. 4,537,865, Cl. 501-135.000.
Okada, Hisafumi; Suzuki, Yoshio; and Takenaka, Shigeo, to Tokyo Shibaura Denki Kabushiki Kaisha. Glass envelope for a cathode-ray tube. 4,537,322, Cl. 220-2.10A.
Okada, Makoto; and Fujita, Kazunori, to Nissan Motor Company, Limited. Exhaust duct connector. 4,537,278, Cl. 181-227.000.
Okada, Takao: *See—*
Mimura, Yoshiyuki; Okada, Takao; and Toda, Akitoshi, 4,537,845, Cl. 430-58.000.
Mimura, Yoshiyuki; Okada, Takao; and Toda, Akitoshi, 4,537,846, Cl. 430-58.000.
Okamoto, Eiji; Fukaya, Yasuhiro; and Chikami, Michio, to Gadelius Kabushiki Kaisha. Heat pipe heat exchanger. 4,537,247, Cl. 165-104.140.
Okamoto, Ken: *See—*
Niino, Shuhei; Ishimura, Koichi; Okamoto, Ken; and Ohba, Koichi, 4,537,051, Cl. 72-12.000.
Okazaki, Sakiho: *See—*
Shinohara, Toshihide; and Okazaki, Sakiho, 4,537,479, Cl. 351-169.000.
Okoshi, Hideo, to Nippon Seiko Kabushiki Kaisha. Infinitely variable toric transmission. 4,537,086, Cl. 74-201.000.
Okumura, Akio: *See—*
Takao, Hiroyoshi; Yamamoto, Keisaku; Imai, Akio; Yoshida, Nobuyuki; Furukawa, Hiroshi; Saito, Yuichi; and Okumura, Akio, 4,537,936, Cl. 525-236.000.
Okumura, Mitsuhiro: *See—*
Yamanaka, Takashi; Takeya, Yasushi; Yorita, Mitsumasa; Horiuchi, Toshiaki; Inagaki, Kouichi; Naya, Eizo; Demizu, Michinosuke; and Okumura, Mitsuhiro, 4,537,743, Cl. 419-38.000.
Olin Corporation: *See—*
Cawlfield, David W.; Moore, William M.; and Stubbs, John L., Jr., 4,537,937, Cl. 525-417.000.
Pryor, Michael J.; Winter, Joseph; and Dantzig, Jonathan A., 4,537,242, Cl. 164-460.000.
Tyler, Derek E.; Cheskis, Harvey P.; and Tungatt, Paul D., 4,537,627, Cl. 75-76.000.
Oljace, Richard L.: *See—*
Heinrich, Andrew L.; and Oljace, Richard L., 4,538,036, Cl. 200-11.0EA.
Olsson, Bengt G. Transistor amplifier. 4,538,117, Cl. 330-277.000.
Olympus Optical Co., Ltd.: *See—*
Asoma, Yoshito, 4,537,472, Cl. 350-414.000.
Mimura, Yoshiyuki; Okada, Takao; and Toda, Akitoshi, 4,537,845, Cl. 430-58.000.
Mimura, Yoshiyuki; Okada, Takao; and Toda, Akitoshi, 4,537,846, Cl. 430-58.000.
Otani, Yutaka, 4,537,182, Cl. 128-4.000.
Sasa, Hiroyuki, 4,537,209, Cl. 134-166.00C.
Shishido, Yoshio, 4,538,062, Cl. 250-201.000.
Takeuchi, Haruo, 4,537,453, Cl. 339-33.000.
Omron Tateisi Electronics Co.: *See—*
Bando, Yoshihide, 4,538,126, Cl. 335-78.000.
Omura, Ikuo; Yamauchi, Junichi; Nagase, Yoshinori; and Uemura, Fumiko, to Kuraray Co., Ltd. Adhesive compositions. 4,537,940, Cl. 526-278.000.
Ong, Helen H.; and Profitt, James A., to Hoechst-Roussel Pharmaceuticals Inc. Benzo[b]thiophenes. 4,537,976, Cl. 549-54.000.
Ono, Keiichi; Sugie, Akihiko; Muraoka, Masami; and Yamamoto, Michihiro, to Sumitomo Chemical Company, Limited. Imino-bicyclo (3.3.0) octane derivatives. 4,537,989, Cl. 562-501.000.
Ono, Takayuki: *See—*
Yamaguchi, Tadashi; Ono, Takayuki; Hirata, Michitoshi; and Yokoyama, Toshihiko, 4,537,645, Cl. 149-3.000.
Onodera, Kaoru: *See—*
Takada, Shun; Onodera, Kaoru; and Kadowaki, Takashi, 4,537,857, Cl. 430-549.000.
Onsrud, Charles R. Routing machines. 4,537,234, Cl. 144-134.00A.
Ontario Research Foundation: *See—*
Lakshmanan, Vaikuntam I.; and Biskupski, Jurgen K., 4,537,628, Cl. 75-118.00R.
Oogai, Michiharu; Seita, Toru; Takeshige, Kosuke; and Shuyama, Hideo, to Toyo Soda Manufacturing Co., Ltd. Method of producing cation-exchange membrane having roughed surface. 4,537,910, Cl. 521-27.000.
Ooshiro, Takehiko; Iwasaki, Masayoshi; Sahara, Kousuke; Suzuki, Norio; Utsumi, Hitoshi; Miyake, Kazuo; and Aburatani, Kenji, to Kabushiki Kaisha Kobe Seiko Sho. Inspection method of square billet using electronic scanning. 4,537,073, Cl. 73-602.000.
Ootsuka, Yoshinori; Hattori, Tadashi; Yamamoto, Minoru; and Ozaki, Tadashi, to Nippon Soken, Inc.; and Nippondenso Co., Ltd. Device for detection of abnormality in pressure detector for internal combustion engine. 4,537,065, Cl. 73-117.300.
Oppenlaender, Knut; Fikentscher, Rolf; Buettner, Egon; Slotman, Wilhelmus; Schwartz, Erich; and Mohr, Rudolf, to BASF Aktiengesellschaft. Demulsifiers for breaking crude-oil emulsions and their use. 4,537,701, Cl. 252-344.000.
Optical Coating Laboratory, Inc.: *See—*
Matteucci, John S.; Snyder, James K.; and Hahn, Robert E., 4,536,998, Cl. 52-171.000.
Optik Innovation AB OIAB: *See—*
Astero, Ulf J., 4,537,474, Cl. 350-432.000.
Orlowski, Ronald C.; and Seyler, Jay K., to Armour Pharmaceutical Co. Des-serine^2 or des-glycine^2-leucine^{22} calcitonin. 4,537,716, Cl. 260-112.50T.
Ormat Turbines (1965) Ltd.: *See—*
Kaplan, Uri, 4,537,032, Cl. 60-662.000.
O'Rourke, Glenn R., to Ex-Cell-O Corporation. Sealing system for road wheel suspension. 4,537,422, Cl. 280-705.000.
Orth, Hans: *See—*
Sabranski, Udo; and Orth, Hans, 4,537,132, Cl. 102-307.000.
Osborne, Duncan W., to Automotive Products plc. Hydraulic cylinder assemblies. 4,537,293, Cl. 188-196.0BA.
Oster, Stanley M.; and Axelrod, Lester. Tensioning and braking pliers. 4,537,099, Cl. 225-93.000.
Ostlinning, Edgar: *See—*
Idel, Karsten; Ostlinning, Edgar; Koch, Wolfgang; Bottenbruch, Ludwig; and Heitz, Walter, 4,537,951, Cl. 528-388.000.
O'Sullivan, Joseph; Aklonis, Carol A.; and Singh, Pushpa, to E. R. Squibb & Sons, Inc. Plastatin. 4,537,858, Cl. 435-119.000.
Otani, Kozo; and Yamada, Yoshio, to Toyo Tire & Rubber Company Limited. Polyether derivative and a poly(urethane)ureamide obtained therefrom. 4,537,945, Cl. 528-68.000.
Otani, Syuichi, to Nissan Motor Co., Ltd. Ash tray assembly of vehicle. 4,537,439, Cl. 296-37.900.
Otani, Yutaka, to Olympus Optical Co., Ltd. Endoscope. 4,537,182, Cl. 128-4.000.
Otis Engineering Corporation: *See—*
Fredd, John V., 4,537,383, Cl. 251-58.000.
Otsu, Kouji: *See—*
Soneda, Mitsuo; Maekawa, Toshikazu; and Otsu, Kouji, 4,538,288, Cl. 377-76.000.

Otsu, Nobuyuki: *See*—
Toraichi, Kazuo; Otsu, Nobuyuki; and Suzuki, Motomu, 4,538,227, Cl. 364-414.000.

Otsuka, Hirotaka; Nakazato, Katsuo; Sannomiya, Kunio; Kawakami, Hidehiko; Tsuchiya, Hiroyoshi; and Uchida, Hideo, to Matsushita Electric Industrial Company, Limited; and Matsushita Graphic Communication Systems, Inc. Method and apparatus for processing video signals. 4,538,184, Cl. 358-283.000.

Ott, Gerhard: *See*—
Barnicol-Ottler, Max; Loczenski, Martin; Mieschke, Norbert; Ott, Gerhard; Przybylski, Gerhard; and Weber, Dietmar, 4,538,022, Cl. 174-113.00R.

Ouellette, Paul J., to AT&T Technologies, Inc. Lead having a solder-preform and preform-carrying finger engageable directly with a contact pad. 4,537,461, Cl. 339-258.00R.

Ovren, Christer: *See*—
Dubon, Chantal; Hok, Bertil; and Ovren, Christer, 4,537,467, Cl. 350-96.200.

Ovshinsky, Stanford R.; Sapru, Krishna; and Liang, Gao, to Energy Conversion Devices, Inc. Electrolytic cell anode. 4,537,674, Cl. 204-290.00R.

Owens-Corning Fiberglas Corporation: *See*—
Armstrong, Gordon P.; Flautt, Martin C.; and Williams, Gary L., 4,537,107, Cl. 83-694.000.
Armstrong, Gordon P.; and Flautt, Martin C., 4,537,610, Cl. 65-3.440.
Uffner, William E.; White, Robert N.; and Harrington, Edward R., 4,537,921, Cl. 524-59.000.

Owens-Illinois, Inc.: *See*—
Francel, Josef; Horn, Uriah; and Stewart, Daniel R., 4,537,862, Cl. 501-14.000.
Whitney, Ralph H., 4,537,319, Cl. 215-252.000.

Owens, William J.: *See*—
Nowobilski, Jeffert J.; and Owens, William J., 4,537,820, Cl. 428-285.000.

Oxenrider, Bryce C.; and Long, David J., to Allied Corporation. Fluorinated and non-fluorinated terminally halogenated alkyl pyromellitates. 4,537,728, Cl. 260-455.00R.

Ozaki, Tadashi: *See*—
Ootsuka, Yoshinori; Hattori, Tadashi; Yamamoto, Minoru; and Ozaki, Tadashi, 4,537,065, Cl. 73-117.300.

Ozaki, Takayuki: *See*—
Yano, Yasuhiro; Umino, Isamu; Ohsawa, Zenichi; and Ozaki, Takayuki, 4,538,121, Cl. 331-25.000.

Ozawa, Kunitaka: *See*—
Saito, Seiji; Ayata, Naoki; Suzuki, Hidetoshi; Ozawa, Kunitaka; and Koumura, Noboru, 4,538,182, Cl. 358-280.000.

Package Machinery Company: *See*—
Groom, James S.; and LaFleur, Paul J., Jr., 4,537,012, Cl. 53-552.000.

Page, Michael: *See*—
Lax, David R.; Page, Michael; and Johnstone, James S., 4,537,076, Cl. 73-662.000.

Palfray, Michel R., to Etablissements Proteor. Device for the alignment research, alignment and orientation of prosthesis of the lower limbs. 4,536,898, Cl. 623-33.000.

Pall Corporation: *See*—
Koslow, Evan E., 4,537,608, Cl. 55-337.000.

Pallos, Ferenc M., to Stauffer Chemical Company. Aryloxyphenoxy proponyl isothioureas and use as herbicides. 4,537,620, Cl. 71-94.000.

Palm, Bernhard. Push-on/quick release locking arrangement for socket wrench extension. 4,537,100, Cl. 81-177.850.

Panak, Edouard: *See*—
Blanchard, Jean; and Panak, Edouard, 4,537,894, Cl. 514-301.000.

Pankoke, Werner, to Theodor Hymmen KG., Firma. Device for applying surface pressure to advancing workpieces. 4,537,408, Cl. 277-34.000.

Pantaleo, Victor. Ski clip holding device. 4,536,926, Cl. 24-523.000.

Papp, Uwe: *See*—
Albrecht, Wolf-Wigand; Hoppe, Axel; Papp, Uwe; and Wolf, Rudiger, 4,537,641, Cl. 148-11.50P.

Papyrus Kopparfors AB: *See*—
Ericsson, Thomas, 4,537,877, Cl. 502-402.000.

Parcevaux, Philippe A.; Piot, Bernard M.; and Vercaemer, Claude J., to Etudes et Fabrication Dowell Schlumberger. Cement compositions for cementing wells, allowing pressure gas-channeling in the cemented annulus to be controlled. 4,537,918, Cl. 523-130.000.

Parg, Adolf; Ziegler, Hans; and Wuerzer, Bruno, to BASF Aktiengesellschaft. Herbicidal diphenyl ethers and their use for controlling undesirable plant growth. 4,537,621, Cl. 71-103.000.

Park-Ohio Industries, Inc.: *See*—
Balzer, Norbert R., 4,537,102, Cl. 83-16.000.
Budzinski, Roger R., 4,538,041, Cl. 219-10.750.

Parker, Alan, to Hollingsworth (U.K.) Limited. Friction spinning. 4,537,021, Cl. 57-401.000.

Parker, John A.: *See*—
Achar, Bappalige N.; Fohlen, George M.; and Parker, John A., 4,537,834, Cl. 428-413.000.

Parker, Leslie L. Device for manipulating invalid bed patients. 4,536,903, Cl. 5-61.000.

Parkinson, Delbert J., to Parkinson, Delbert J.; and Haefliger, William W., a part interest. Record jacket frame permitting record removal. 4,536,979, Cl. 40-159.000.

Parquet, Donald J., to J. I. Case Company. Seat belt assembly. 4,537,274, Cl. 180-270.000.

Parr, Rodney W., to Dulux Australia Ltd. Non-ionic unsaturated chemical compounds. 4,538,000, Cl. 568-616.000.

Parravicini, Roberto. Implant device for substaining the activity of the myocardium. 4,536,893, Cl. 623-3.000.

Pascas, Brian J.: *See*—
Benning, Gordon D.; Pascas, Brian J.; Blackhall, Robert K.; Wilker, Paul S.; and Neathway, Graham A., 4,538,031, Cl. 179-81.00B.

Pass & Seymour, Inc.: *See*—
Ronemus, DeHertburn N.; and Tice, Victor M., 4,538,040, Cl. 200-159.00A.

Passarotti, Carlo: *See*—
Doria, Gianfederico; Passarotti, Carlo; and Buttinoni, Ada, 4,537,962, Cl. 544-255.000.

Passemard, Jean R.; and Keledjian, Gaston, to Regie Nationale des Usines Renault. Rectilinear transfer mechanism with pulleys and belts. 4,537,084, Cl. 74-89.220.

Pasternack, George: *See*—
Bishop, Timothy E.; Pasternack, George; and Zimmerman, John M., 4,537,667, Cl. 204-159.150.

Paul Rauschert GmbH & Co. KG: *See*—
Billet, Reinhard; Kober, Rainer; Mackowiak, Jerzy; and Geipel, Werner, 4,537,731, Cl. 261-94.000.

Paul, Volker: *See*—
Naumann, Klaus; Scheinpflug, Hans; Rosslenbroich, Hans-Jurgen; and Paul, Volker, 4,537,888, Cl. 514-228.000.

Pauze, Denis R.: *See*—
Keane, John J.; and Pauze, Denis R., 4,537,804, Cl. 427-118.000.

Peacock Investments (Proprietary) Limited: *See*—
Raubenheimer, Johann N., 4,536,908, Cl. 15-1.700.

Pearce, Godfrey R.: *See*—
Coe, Jerry R.; Pearce, Godfrey R.; and See, Francis R., 4,538,025, Cl. 174-52.00S.

Pearson, Beverly. Umbrella support. 4,537,339, Cl. 224-188.000.

Pearson, William K. J.: *See*—
Bryant, Greyham F.; Spooner, Peter D.; and Pearson, William K. J., 4,537,050, Cl. 72-8.000.

Pebeyre, Pierre-Jean; Gleyze, Rene ; and Montant, Charles, to S. A. Pebeyre. Product for the fertilization of mycorhizal mushrooms and application to the fertilization of truffle-beds. 4,537,613, Cl. 71-5.000.

Peel, Edward: *See*—
James, Benjamin B.; and Peel, Edward, 4,538,038, Cl. 200-61.710.

Peiffer, Dennis G.; Lundberg, Robert D.; and Pober, Kenneth W., to Exxon Research and Engineering Co. Low and high temperature drilling fluids based on sulfonated terpolymer ionomers. 4,537,688, Cl. 252-8.50M.

Pellico, Michael A.; and Montgomery, Robert E., to Laclede Professional Products, Inc. Stabilized enzymatic dentifrice containing B-D-glucose and glucose oxidase. 4,537,764, Cl. 424-50.000.

Peltzman, William S.; Rohlfing, Raymond A.; and Gates, Charles C., Jr., to Gates Rubber Company, The. Method for curing a flexible hose. 4,537,736, Cl. 264-130.000.

Pemco-Kalamazoo, Inc.: *See*—
Black, John W.; Shupe, Richard D.; and Simon, Earl, 4,537,570, Cl. 425-450.100.

Pennella, Filippo: *See*—
Lin, Fan-Nan; and Pennella, Filippo, 4,537,909, Cl. 518-713.000.

Pennwalt Corporation: *See*—
Boorsma, Nancy B., 4,537,309, Cl. 206-525.000.
Griffith, Ronald C.; and Kinsolving, Clyde R., 4,537,908, Cl. 514-659.000.
Murray, Robert J., 4,537,966, Cl. 546-120.000.

Percel, Phillip J.; and Perkins, Douglas W., to SCM Corporation. Process of preparing a particulate food acidulant. 4,537,784, Cl. 426-303.000.

Perkin-Elmer Corporation, The: *See*—
Ausschnitt, Christopher P., 4,538,105, Cl. 324-158.00R.
Hill, Harold I.; Norem, Stanley D.; and Targowski, Roger, 4,537,572, Cl. 432-55.000.

Perkins, Douglas W.: *See*—
Percel, Phillip J.; and Perkins, Douglas W., 4,537,784, Cl. 426-303.000.

Perlegos, George: *See*—
Smarandoiu, George; and Perlegos, George, 4,538,245, Cl. 365-200.000.

Perper, Lloyd J., to Iota Engineering Co. Lamp ballast with near unity power factor and low harmonic content. 4,538,094, Cl. 315-221.000.

Perry, Huntley H., to United States of America, Navy. Adapter for towing aircraft. 4,537,369, Cl. 244-1.00R.

Personal Products Company: *See*—
Pieniak, Heinz A.; and Iskra, Michael J., 4,537,590, Cl. 604-379.000.

Peterman, Worthy D.: *See*—
Cashwell, Miles L.; and Peterman, Worthy D., 4,536,919, Cl. 17-11.000.

Petersen, Arthur W.; and Smialowicz, Dennis T., to American Cyanamid Co. Method for removal of undesirable organic matter. 4,537,638, Cl. 134-2.000.

Petersen, Kurt-Eckart: *See*—
Lorenzen, Heinz-Christen; Heitmann, Uwe; Petersen, Kurt-Eckart; and Pinck, Peter, 4,537,206, Cl. 131-281.000.

Petersen, Oscar J.; Barton, Ross J.; Dalke, Jack E.; Sheffield, Gerald W.; and Towle, Theodore, to Brunswick Corporation. In-line check valve having combined downstream poppet support and flow control elements. 4,537,384, Cl. 251-83.000.

Peterson, Jan B.: *See*—
Baltzer, Karen L.; and Peterson, Jan B., 4,538,229, Cl. 364-428.000.

Peterson, Richard M.: *See*—
Sinniger, Joseph O.; and Peterson, Richard M., 4,538,262, Cl. 370-85.000.

Peterson, Thomas A., to AT&T Bell Laboratories. Direct memory access peripheral unit controller. 4,538,224, Cl. 364-200.000.

Petho, Hajnalka: *See*—
Kreidl, Janos; Farkas nee Kirjak, Maria; Harsanyi, Kalman; Benke, Bela ; Rado, Andras; Domany, Gyorgy; Hegedus, Bela; Csongor, Eva; Deutsch nee Juhasz, Ida; and Petho, Hajnalka, 4,537,900, Cl. 514-400.000.

Petitjean, Christian; and Marchand, Maurice, to LMT Radio Professionnelle. Coherent radar. 4,538,148, Cl. 343-17.20R.

Petrolite Corporation: *See*—
Naiman, Michael I., 4,537,601, Cl. 44-62.000.

Petrovic, Milan: *See*—
Gsponer, Arnold; Huber, Werner; and Petrovic, Milan, 4,537,302, Cl. 198-626.000.

Pfaff Industriemaschinen GmbH: *See*—
Angele, Werner, 4,536,891, Cl. 2-409.000.

Pfeifer, George F., to General Electric Company. Base drive circuit controller. 4,538,078, Cl. 307-592.000.

Pfeiffer, Roland; and Waldhecker, Heinz-Dieter, to Klockner-Humboldt-Deutz AG. Method for the production of reaction gases. 4,537,626, Cl. 75-35.000.

Pflanz, Herbert M., to Phoenix Electric Corporation. Passively detonated explosively-assisted fuse. 4,538,133, Cl. 337-4.000.

Pfortmiller, Donald D. Boot carrier. 4,537,436, Cl. 294-150.000.

Pham Van Cang, Luc, to Thomson-CSF. Test-signal generating device for testing electronic equipment. 4,538,268, Cl. 371-20.000.

Pharmacia Aktiebolag: *See*—
Rothman, Ulf S. E.; and Jacobsson, Sten A. L., 4,537,767, Cl. 424-78.000.

Phelps, Andrew E.: *See*—
Levin, Burton L.; Phelps, Andrew E.; and Potash, Hanan, 4,538,241, Cl. 364-900.000.

Philippe, Calin, to Regie Nationale des Usines Renault. Locking device, particularly for a spare wheel cradle. 4,537,431, Cl. 292-216.000.

Phillipps, Patrick G.; and Schenkel, Jeffrey, to American Home Products Corporation (Del.). Systems and methods for processing physiological signals. 4,537,196, Cl. 128-630.000.

Phillips Petroleum Company: *See*—
Carter, Cecil O., 4,538,018, Cl. 585-512.000.
Hawley, Gil R., 4,537,870, Cl. 502-111.000.
Johnson, Marvin M.; and McDaniel, Max P., 4,537,928, Cl. 524-417.000.
Lin, Fan-Nan; and Pennella, Filippo, 4,537,909, Cl. 518-713.000.
Macdonell, Gary D.; Lindstrom, Merlin R.; Baldwin, Bernard A.; Louthan, Rector P.; and Schuettenberg, Alexander D., 4,537,690, Cl. 252-48.400.
McDaniel, Max P., 4,537,869, Cl. 502-107.000.
Roberts, John S., 4,537,994, Cl. 568-59.000.
Uraneck, Carl A.; and Burleigh, John E., 4,537,932, Cl. 524-572.000.

Phillipson, Walter M.: *See*—
Brennan, Robert J.; Meighen, Terrence; and Phillipson, Walter M., 4,537,459, Cl. 339-143.00R.

Phoenix Electric Corporation: *See*—
Pflanz, Herbert M., 4,538,133, Cl. 337-4.000.

Phuc, Tran N., to Senki Medical Instrument Mfg. Co., Ltd. Gas jet device for use in respirators. 4,537,188, Cl. 128-200.210.

Piber, Herbert: *See*—
Koroncai, Adam; Nowak, Alfred; and Piber, Herbert, 4,536,956, Cl. 30-43.920.

Pieniak, Heinz A.; and Iskra, Michael J., to Personal Products Company. Superthin absorbent product. 4,537,590, Cl. 604-379.000.

Pieper, Hartwig: *See*—
Burger, Arnulf; Scharff, Karl-Heinz; Geiger, Kurt; Schnee, Gunther; and Pieper, Hartwig, 4,536,909, Cl. 15-4.000.

Pieper, Josefa: *See*—
Donike, Wilhelm; Ulrich, Helmut; Thiemer, Heinz; and Pieper, Josefa, 4,538,013, Cl. 585-361.000.

Piercy, William B., to United States of America, Navy. Adjustable self-releasing hook. 4,537,434, Cl. 294-82.310.

Pieri, Vincenzo, to SORMA S.r.l. Automatic apparatus for individually enshrouding fruit and vegetable containers in a net provided with a reinforcing strip and a label. 4,537,006, Cl. 53-134.000.

Pikarski, Michael; Gabe, Julian; and Dykman, Edmund, to Agan Chemical Manufacturers, Ltd. Method for removal of nitrosoamine impurities from herbicides. 4,537,992, Cl. 564-437.000.

Pinck, Peter: *See*—
Lorenzen, Heinz-Christen; Heitmann, Uwe; Petersen, Kurt-Eckart; and Pinck, Peter, 4,537,206, Cl. 131-281.000.

Pinkhasov, Eduard, to Wedtech Corp. Method of coating ceramics. 4,537,794, Cl. 427-37.000.

Pioneer Electronic Corporation: *See*—
Ishibashi, Masaya; and Tada, Atuki, 4,538,253, Cl. 369-34.000.

Pioneer Industrial Products Company: *See*—
Barnett, Steve M.; Flowers, Michael A.; and Varos, John A., 4,536,890, Cl. 2-164.000.

Piot, Bernard M.: *See*—
Parcevaux, Philippe A.; Piot, Bernard M.; and Vercaemer, Claude J., 4,537,918, Cl. 523-130.000.

Piper, Louis H., to Infilco Degremont Inc. Open gravity backwash filter and method. 4,537,687, Cl. 210-793.000.

Pipper, Gunter: *See*—
Schmidt, Franz; Pipper, Gunter; Floss, Josef G.; and Zahradnik, Franz, 4,537,949, Cl. 528-335.000.

Pizzurro, Vito F., to Ford Aerospace & Communications Corporation. Optical growth compensator. 4,537,370, Cl. 244-3.160.

Plastic Specialties and Technologies, Inc.: *See*—
Nangrani, Khemchand J., 4,537,929, Cl. 524-504.000.

Plath, Peter; Eicken, Karl; Sauter, Hubert; and Wuerzer, Bruno, to BASF Aktiengesellschaft. 3-Phenyl-4-methoxycarbonylpyrazoles and their use for controlling undesirable plant growth. 4,537,617, Cl. 71-92.000.

Platt, James L., Jr.; and Ellis, John R. B., to Chevron Research Company, Inc. Removing water from honey at ambient pressure. 4,536,973, Cl. 34-182.000.

Plessey Overseas Limited: *See*—
Rhodes, Stephen J.; and Oakley, Raymond E., 4,536,951, Cl. 29-589.000.

Plotnikoff, Nicholas P., to TNI Pharmaceuticals, Inc. Process for using endogenous enkephalins and endorphins to stimulate the immune system. 4,537,878, Cl. 514-2.000.

Plough, Inc.: *See*—
Russ, Julio G.; and Barrom, Donna L., 4,537,766, Cl. 424-63.000.

Plumail, Jean-Claude: *See*—
Toulhoat, Herve ; Plumail, Jean-Claude; Mercier, Marc; and Jacquin, Yves, 4,537,875, Cl. 502-314.000.

Pober, Kenneth W.: *See*—
Peiffer, Dennis G.; Lundberg, Robert D.; and Pober, Kenneth W., 4,537,688, Cl. 252-8.50M.

Podmela, Ladislav: *See*—
Bursa, Miloslav; Musil, Frantisek; and Podmela, Ladislav, 4,537,094, Cl. 74-804.000.

Pohjavahvistus Oy: *See*—
Juhola, Mauno O.; and Numminen, Matti, 4,537,527, Cl. 405-50.000.

Polky, John N.: *See*—
Miller, Dale D.; and Polky, John N., 4,537,502, Cl. 356-5.000.

Pollman, Frederic W.; Reynolds, David W.; and Heiser, Richard, to Sundstrand Corporation. Constant tension cable reel drive. 4,537,364, Cl. 242-86.510.

Polyflex Schwarz GmbH & Co.: *See*—
Schwarz, Hans G., 4,537,222, Cl. 138-130.000.

Polysar International S.A.: *See*—
Oberle, Patrick; Longuet, Michel; and Walker, David, 4,537,915, Cl. 521-84.100.

Pongo, Laszlo : *See*—
Horvath, Istvan; Lang, Tibor; Pongo, Laszlo ; Reiter, Jozsef; Somorai, Tamas; Szilagyi, Geza; and Toldy, Lajos, 4,537,899, Cl. 514-384.000.

Pool, Danny J. Joystick occlusion gate control for video games. 4,538,035, Cl. 200-6.00A.

Popchock, Richard T.: *See*—
Lech, Thaddeus, Jr.; and Popchock, Richard T., 4,537,296, Cl. 192-106.200.

Potash, Hanan: *See*—
Levin, Burton L.; Phelps, Andrew E.; and Potash, Hanan, 4,538,241, Cl. 364-900.000.

Potts, Anthony M.: *See*—
Boothe, Nancy G.; and Potts, Anthony M., 4,536,925, Cl. 24-511.000.

Potts, Thomas M.: *See*—
Walker, Joe M.; and Potts, Thomas M., 4,537,759, Cl. 423-349.000.

Powell, Robert M. Intraocular lens. 4,536,897, Cl. 623-6.000.

PPG Industries, Inc.: *See*—
McEathron, Eugene D., 4,537,609, Cl. 65-1.000.

Prather, Herbert W., Jr. Method of playing a moving surface ball game. 4,537,402, Cl. 273-116.000.

Pratt, John D.; and Ramirez, Raymond, to Monogram Industries, Inc. Wedge-type low profile fastener. 4,537,542, Cl. 411-55.000.

Precision Monolithics, Inc.: *See*—
Butler, James R., 4,538,115, Cl. 330-253.000.

Press, Inc., The: *See*—
Thul, James L., 4,537,310, Cl. 206-526.000.

Press, Irving D.; Nickerson, Harvey R.; and Rink, Helm A., to UMC Industries, Inc. High integrity flange connection arrangement. 4,537,425, Cl. 285-55.000.

Prestel, David J., to Gould Inc. Fiber optic acoustic transducer intrusion detection system. 4,538,140, Cl. 340-556.000.

Priebe, Waldemar: *See*—
Horton, Derek; and Priebe, Waldemar, 4,537,882, Cl. 514-34.000.

Prime Computer, Inc.: *See*—
Bahr, Richard G.; and Moore, Russell L., 4,538,264, Cl. 371-8.000.

Procter & Gamble Company, The: *See*—
Cooper, Eugene R., 4,537,776, Cl. 514-424.000.
Liepa, Alexander L., 4,537,783, Cl. 426-243.000.
Severson, Roland G., Jr., 4,537,706, Cl. 252-545.000.
Severson, Roland G., Jr., 4,537,707, Cl. 252-545.000.

Proctor & Schwartz, Inc.: *See*—
George, Kurudamannil A., 4,537,122, Cl. 99-516.000.

Proctor, Valerie A.; and Cunningham, Franklin E., to Kansas State University Research Foundation. Egg jerky product and method of preparation. 4,537,788, Cl. 426-614.000.

Profitt, James A.: *See*—
Ong, Helen H.; and Profitt, James A., 4,537,976, Cl. 549-54.000.

Prolss, Norbert: *See*—
Hassler, Heinrich; Muller, Reiner; Kippenberg, Horst; and Prolss, Norbert, 4,537,745, Cl. 420-590.000.

Properzi, Giulio. Rolling unit for a bar or the like rolling mill. 4,537,054, Cl. 72-224.000.

Prvni brnenska stojirna, koncernovy podnik: *See*—
Bursa, Miloslav; Musil, Frantisek; and Podmela, Ladislav, 4,537,094, Cl. 74-804.000.

Pryor, James W., to R. J. Reynolds Tobacco Company. Method and apparatus for conveying filter tow. 4,537,583, Cl. 493-42.000.

Pryor, Michael J.; Winter, Joseph; and Dantzig, Jonathan A., to Olin Corporation. Method and apparatus for forming a thixoforged copper base alloy cartridge casing. 4,537,242, Cl. 164-460.000.

Przybylski, Gerhard: *See*—
Barnicol-Ottler, Max; Loczenski, Martin; Mieschke, Norbert; Ott, Gerhard; Przybylski, Gerhard; and Weber, Dietmar, 4,538,022, Cl. 174-113.00R.

Pulsmeier, Harald; and Best, Walter. Apparatus for testing the air-permeability of lengths of textiles. 4,536,971, Cl. 34-89.000.

Pum, Hans G.: *See*—
Feyerl, Gunther; Minichshofer, Klaus; and Pum, Hans G., 4,536,927, Cl. 28-110.000.

Puma-Sportschuhfabriken Rudolf Dassler KG: *See*—
Adam, Gunter, 4,537,399, Cl. 273-75.000.
Adam, Gunter, 4,537,400, Cl. 273-75.000.

Puri, Rajen, to Standard Oil Company (Indiana). Method of underground conversion of coal. 4,537,252, Cl. 166-245.000.

Purinton, Robert J., Jr., to Dow Chemical Company, The. Organic gels. 4,537,700, Cl. 252-315.100.

Puskas, Imre; and Schmitt, Marshall, to Standard Oil Company (Indiana). Process for the manufacture of 1,4-bis[2-(4'-carbomethoxystyrenyl)] benzene. 4,537,985, Cl. 560-96.000.

Putnam, David. Food storage container. 4,537,044, Cl. 62-371.000.

Quantum Corporation: *See*—
Dimmick, W. Scott; Mitchell, Charles S.; and Moon, William G., 4,538,193, Cl. 360-137.000.
Moon, Ronald R., 4,538,099, Cl. 318-678.000.

Quinby, Thomas C., to United States of America, Energy. Method for production of ceramic oxide and carbide bodies by polymer inclusion and decomposition. 4,537,818, Cl. 428-262.000.

Qureshi, Shahid: *See*—
Lang, Gordon R.; Forney, George D., Jr.; Qureshi, Shahid; Longstaff, Fred M.; and Lee, Chi H., 4,538,284, Cl. 375-39.000.

R. J. Reynolds Tobacco Company: *See*—
Pryor, James W., 4,537,583, Cl. 493-42.000.

Rackliffe, John R.: *See*—
De Metz, Frederick C.; and Rackliffe, John R., 4,538,250, Cl. 367-154.000.

Radiation Dynamics, Inc.: *See*—
Morganstern, Kennard H., 4,537,734, Cl. 264-22.000.

Radmore, Robert R.; and Hall, John T., to Carborundum Abrasives Company. Pendulum roll loader. 4,537,368, Cl. 242-58.600.

Rado, Andras: *See*—
Kreidl, Janos; Farkas nee Kirjak, Maria; Harsanyi, Kalman; Benke, Bela ; Rado, Andras; Domany, Gyorgy; Hegedus, Bela; Csongor, Eva; Deutsch nee Juhasz, Ida; and Petho, Hajnalka, 4,537,900, Cl. 514-400.000.

Radulovacki, Miodrag, to University of Illinois Foundation. Hypnotic composition and method of inducing sleep. 4,537,907, Cl. 514-567.000.

Rain Bird Sprinkler Mfg. Corp.: *See*—
Lawson, Kenneth L., 4,537,356, Cl. 239-230.000.

Raisin, Helmut: *See*—
Schaetzer, Harry; Raisin, Helmut; and Mausezahl, Dieter, 4,537,598, Cl. 8-641.000.

Rajan, John A., to Rockwell International Corporation. Adaptive acquisition of multiple access codes. 4,538,281, Cl. 375-2.200.

Ramirez, Raymond: *See*—
Pratt, John D.; and Ramirez, Raymond, 4,537,542, Cl. 411-55.000.

Ramsay, Michael: *See*—
Freige, Diab E.; Lockwood, John J.; Ramsay, Michael; and Keely, Leroy B., 4,538,073, Cl. 307-33.000.

Ramsch, Klaus-Dieter: *See*—
Hoff, Dieter; and Ramsch, Klaus-Dieter, 4,537,898, Cl. 514-356.000.

Ramsey, William C.: *See*—
Spengler, William E.; and Ramsey, William C., 4,537,334, Cl. 222-401.000.

Ranade, Gautam R.: *See*—
Walker, Leigh E.; and Ranade, Gautam R., 4,537,933, Cl. 525-71.000.

Rangwala, Badruddin K.; and Flack, Toney S., to Ex-Cell-O Corporation. Filler means for charging containers. 4,537,335, Cl. 222-496.000.

Rao, Velliyur N. M.; and Heinsohn, George E., to Du Pont de Nemours, E. I., and Company. Multi-stage process with adiabatic reactors for the preparation of isocyanates. 4,537,726, Cl. 260-453.00P.

Rascher, Andreas: *See*—
Baier, Manfred; and Rascher, Andreas, 4,538,131, Cl. 336-57.000.

Rationator-Maschinenbau GmbH: *See*—
Schindel, Hugo, 4,537,230, Cl. 141-146.000.

Raubenheimer, Johann N., to Peacock Investments (Proprietary) Limited. Suction cleaners. 4,536,908, Cl. 15-1.700.

Ray, Roger C.: *See*—
Banks, Edwin R.; Ray, Roger C.; and Dale, Paul B., 4,538,225, Cl. 364-200.000.

Raychem Corporation: *See*—
Moisson, Marc F.; and Wisecarver, Martin L., 4,537,466, Cl. 350-96.200.
Morrow, Danny G.; and Oiwa, Thomas Y., 4,538,053, Cl. 219-541.000.
Tucker, Donald, 4,538,020, Cl. 174-65.00R.

RCA Corporation: *See*—
Bolger, Thomas V., 4,538,178, Cl. 358-166.000.
Deyer, Craig E., 4,538,027, Cl. 178-22.010.
Dischert, Robert A.; and Meise, William H., 4,538,236, Cl. 364-574.000.
Hawkes, Thaddeus A., 4,538,120, Cl. 331-12.000.
Morrison, Melvin M., 4,538,124, Cl. 333-246.000.
Sinniger, Joseph O.; and Peterson, Richard M., 4,538,262, Cl. 370-85.000.

Reasor, Warren; and Singleton, Mary L. Limousine hearse. 4,537,438, Cl. 296-17.000.

Rebhahn, Robert W. J.; Kassner, James E.; and Werner, Raymond E., to Hilton-Davis Chemical Co., The. Process for preparing quinolinic acid. 4,537,971, Cl. 546-320.000.

Redlich, Horst, to TELDEC Telefunken-Decca Schallplatten GmbH. Method and apparatus for cutting information into a record carrier. 4,538,256, Cl. 369-88.000.

Reed, Gordon A. D.; and Itzkovitch, Irwin J., to Liquid Carbonic Inc. Hydrogen storage system. 4,537,761, Cl. 423-644.000.

Rees, Karl, to Sulzer Brothers Limited. Heat exchanger having a vertical gas flue. 4,537,156, Cl. 122-6.00A.

Reese Enterprises, Inc.: *See*—
Ellingson, Robert T., 4,537,002, Cl. 52-403.000.

Reeves Brothers, Inc.: *See*—
Griswold, Azel A., 4,537,912, Cl. 521-53.000.

Regalbuto, John A.; and Dines, Jack E., to Jet Research Center, Inc. Back-off tool. 4,537,255, Cl. 166-297.000.

Regie Nationale des Usines Renault: *See*—
Passemard, Jean R.; and Keledjian, Gaston, 4,537,084, Cl. 74-89.220.
Philippe, Calin, 4,537,431, Cl. 292-216.000.

Rehfeldt, Karl H., to U.S. Philips Corporation. Method of and circuit arrangement for recording a color video signal. 4,538,187, Cl. 358-330.000.

Rehrig, B. Houston. Plastic basket for use with a cart having front and rear baskets. 4,537,413, Cl. 280-33.99B.

Reichert, Jack R.: *See*—
Jones, Robert A.; and Reichert, Jack R., 4,536,901, Cl. 4-416.000.

Reichhold Limited: *See*—
Kambanis, Stamatis M.; Berchem, Antoine; Gregoire, Dennis; and Rybicky, Jaroslav, 4,537,941, Cl. 527-403.000.

Reid, John H. Conservation of momentum in a barrier oxidation ditch. 4,537,679, Cl. 210-194.000.

Reid, Robert E.: *See*—
Sepulveda, Frank J.; and Silva, Robert R., 4,537,237, Cl. 160-201.000.

Reiff, Werner: *See*—
Kehrer, Hans-Peter; Villain, Juergen; and Reiff, Werner, 4,537,793, Cl. 427-35.000.

Reimer, William A., to GTE Automatic Electric Incorporated. Double file printed wiring board module. 4,538,209, Cl. 361-395.000.

Reissenweber, Gernot; Kersten, Siegfried; Ditter, Walter; and Jacobs, Peter, to BASF Aktiengesellschaft. Preparation of pyrocatechol methylcarbamate. 4,537,986, Cl. 560-132.000.

Reist, Walter, to Ferag AG. Apparatus for addressing newspapers, journals and other printed products. 4,538,161, Cl. 346-140.00R.

Reiter, Jozsef: *See*—
Horvath, Istvan; Lang, Tibor; Pongo, Laszlo ; Reiter, Jozsef; Somorai, Tamas; Szilagyi, Geza; and Toldy, Lajos, 4,537,899, Cl. 514-384.000.

Rekewitz, Rudolf; and Wambach, Hermann, to Siemens Aktiengesellschaft. Paper feed mechanism with varying contact pressure. 4,537,521, Cl. 400-637.600.

Remco Italia S.p.A.: *See*—
Mancini, Paolo; Taddei, Alessandro; Macerata, Alberto; and Marchesi, Carlo, 4,537,202, Cl. 128-712.000.

Renaud, Pierre, to VALEO. Clutch release bearing with spacer member. 4,537,294, Cl. 192-98.000.

Renes, Harrie: *See*—
van der Weerdt, Antonius J. A.; and Renes, Harrie, 4,537,702, Cl. 252-522.00R.

Repco Ltd.: *See*—
Hooper, Lindsay A., 4,537,396, Cl. 272-130.000.

Replicap Products, Inc.: *See*—
Ruhl, Gerald F., 4,537,739, Cl. 264-247.000.

Research Corporation: *See*—
Darling, Charles M., 4,537,781, Cl. 514-616.000.

Research Triangle Institute: *See*—
Allen, Crowley C., Jr., 4,537,217, Cl. 137-561.00A.

Resnick, Brian J.; Messina, Elena R.; Bhatia, Madhukar; and Holmes, John G., to Cincinnati Milacron Inc. Apparatus and method for oscillatory motion control. 4,538,233, Cl. 364-513.000.

Reust, Dennis K.; and Gergely, John S., to Conoco Inc. Method and apparatus for controlling altitude. 4,538,230, Cl. 364-433.000.

Rewcastle, Gordon W.; Atwell, Graham J.; Baguley, Bruce C.; and Denny, William A., to Development of Finance Corporation of New Zealand. Dimethylphosphoramidates. 4,537,729, Cl. 260-944.000.

Reynolds, David W.: *See*—
Pollman, Frederic W.; Reynolds, David W.; and Heiser, Richard, 4,537,364, Cl. 242-86.510.

Reynolds Industries, Inc.: *See*—
Malone, Edgar W., 4,538,088, Cl. 313-325.000.
Reynolds, John E.: *See*—
Nicklas, Roger W.; Reynolds, John E.; and Schiestl, Randall L., 4,536,928, Cl. 29-1.200.
Rheinmetall GmbH: *See*—
Sabranski, Udo; and Orth, Hans, 4,537,132, Cl. 102-307.000.
Rhoades, Reginald L. Shelving means. 4,537,379, Cl. 248-222.200.
Rhodes, Stephen J.; and Oakley, Raymond E., to Plessey Overseas Limited. Method of producing a layered structure. 4,536,951, Cl. 29-589.000.
Rhone-Poulenc Specialites Chimiques: *See*—
Robin, Jean, 4,537,961, Cl. 544-193.000.
Rhone-Poulenc Specialites Chimiques "Les Miroirs": *See*—
Jas, Jean-Noel, 4,537,699, Cl. 252-313.200.
Ribbing, Wilfried: *See*—
Bartmann, Martin; Bax, Hanns-Jorg; Burzin, Klaus; and Ribbing, Wilfried, 4,537,948, Cl. 528-215.000.
Rice, Thomas E.; and Staropoli, Paul R., to Haskell of Pittsburgh, Inc. Lateral file receding posting shelf. 4,537,452, Cl. 312-314.000.
Rich. Hengstenberg, Firma: *See*—
Hengstenberg, Eckart; and Disch, Heinrich, 4,537,017, Cl. 53-515.000.
Richard, Joseph D. Ultrasonic doppler fish detector. 4,538,249, Cl. 367-94.000.
Richards, Oliver L., Jr., to Sprague Electric Company. Linear signal strength detector in AM radio. 4,538,300, Cl. 455-161.000.
Richter Gedeon Vegyeszeti Gyar R.T.: *See*—
Kreidl, Janos; Farkas nee Kirjak, Maria; Harsanyi, Kalman; Benke, Bela ; Rado, Andras; Domany, Gyorgy; Hegedus, Bela; Csongor, Eva; Deutsch nee Juhasz, Ida; and Petho, Hajnalka, 4,537,900, Cl. 514-400.000.
Richter, Thomas A. Apodized mirror optical system. 4,537,478, Cl. 350-611.000.
Richter, Wolfgang: *See*—
Schneider, Heinz-Walter; Richter, Wolfgang; Disteldorf, Walter; and Kummer, Rudolf, 4,537,987, Cl. 560-193.000.
Ricoh Co. Ltd.: *See*—
Hashimoto, Mitsuru, 4,537,844, Cl. 430-58.000.
Komada, Kenya; Yuasa, Kazuhiro; and Kondoh, Shiroh, 4,537,491, Cl. 355-3.0DD.
Takigawa, Nobuhiro; Watanabe, Hideo; Kawasaki, Kanzirou; Kubo, Keishi; Hakiri, Minoru; and Kawamura, Eiichi, 4,538,164, Cl. 346-209.000.
Rider, Earle B. Stand for dispensing filamentary material from reels. 4,537,106, Cl. 83-650.000.
Riehle, Harald. Slide rule. 4,538,055, Cl. 235-70.00R.
Riekkinen, Asko S.: *See*—
Kirjavainen, Kari; and Riekkinen, Asko S., 4,538,173, Cl. 358-75.000.
Riexinger sen., Gustav; and Nagel, Rudolf, to Tuerenwerke Riexinger GmbH & Co. KG. Device for manufacturing a shutter link for a multi-link overhead shutter or roller blind. 4,536,929, Cl. 29-33.00K.
Rink, Helm A.: *See*—
Press, Irving D.; Nickerson, Harvey R.; and Rink, Helm A., 4,537,425, Cl. 285-55.000.
Ritsko, Joseph E.; and Acla, Howard L., to GTE Products Corporation. Process for producing high purity tantalum oxide. 4,537,750, Cl. 423-65.000.
Ritter, Joachim A.; Bock, Edward C.; Spinelli, Richard A.; and Dennis, John R., to Xerox Corporation. Imaging system for producing reduced or enlarged images of an original document. 4,537,499, Cl. 355-58.000.
Rizkalla, Nabil, to Halcon SD Group, Inc., The. Carbonylation catalyst. 4,537,871, Cl. 502-161.000.
Robbins, Daniel H.: *See*—
Lein, Juergen G.; and Robbins, Daniel H., 4,537,492, Cl. 355-3.0FU.
Robert Bosch GmbH: *See*—
Emmerling, Hans-Jorg; and Hamm, Josef, 4,537,014, Cl. 53-570.000.
Hinke, Walter; and Kaiser, Harry, 4,538,082, Cl. 310-152.000.
Kotter, Wolfgang, 4,537,218, Cl. 137-596.130.
Schmid, Wolfgang; Wanner, Karl; Falchle, Jorg; Bleicher, Manfred; and Muller, Frank, 4,537,264, Cl. 173-48.000.
Roberts, Bruce B.: *See*—
Thorsheim, Howard I.; and Roberts, Bruce B., 4,537,576, Cl. 434-404.000.
Roberts, Charles G.; and Hall, Joseph E., to Texas Instruments Incorporated. Floating gate amplifier using conductive coupling for charge coupled devices. 4,538,287, Cl. 377-60.000.
Roberts, Harold D. Denture support frame. 4,537,575, Cl. 433-176.000.
Roberts, John S., to Phillips Petroleum Company. Sulfide metathesis. 4,537,994, Cl. 568-59.000.
Roberts, Peter, to Thrush Incorporated. Exhaust extension pipe replacement kit. 4,537,280, Cl. 181-243.000.
Robertson, Allan J.: *See*—
Savides, Christos; and Robertson, Allan J., 4,537,993, Cl. 568-14.000.
Robin, Jean, to Rhone-Poulenc Specialites Chimiques. Catalytic cyclotrimerization of polyisocyanates. 4,537,961, Cl. 544-193.000.
Robinson, Gene C.: *See*—
McKinnie, Bonnie G.; and Robinson, Gene C., 4,537,724, Cl. 260-400.000.
Robinson, Leon H.: *See*—
Davis, Albert P., Jr.; and Robinson, Leon H., 4,537,457, Cl. 339-117.00P.
Rock Bit Industries U.S.A., Inc.: *See*—
Estes, Roy D.; and Wright, Beaumont B., 4,537,409, Cl. 277-83.000.
Rock, Erich; and Brustle, Klaus, to Julius Blum Gesellschaft m.b.H. Furniture hinge having a spring biased pivoting pressure member. 4,536,917, Cl. 16-288.000.
Rockwell International Corporation: *See*—
Fadner, Thomas A.; and Hycner, Stanley H., 4,537,127, Cl. 101-141.000.
Henning, Jerrold V., 4,538,235, Cl. 364-569.000.
Hogge, Charles R., Jr., 4,538,283, Cl. 375-14.000.
Kiamco, Roberto C.; and Skipor, Eugene, Jr., 4,537,390, Cl. 270-53.000.
Rajan, John A., 4,538,281, Cl. 375-2.200.
Williams, Richard J., 4,536,936, Cl. 29-447.000.
Rode, Melvin A.: *See*—
Gunda, Rajamouli; McCarty, Michael R.; and Rode, Melvin A., 4,537,029, Cl. 60-390.000.
Rodime Limited: *See*—
White, James N. J.; and Caithness, Michael G., 4,538,192, Cl. 360-98.000.
Rogers, Brian H.; and Tucker, Paul A., to Normalair-Garrett (Holdings) Limited. Gas flow controllers for aircraft molecular sieve type gas separation systems. 4,537,607, Cl. 55-163.000.
Rogers, Colin C.; Baker, John N.; and Estebanez, Joseph, to Shell Oil Company. Method and system for tank overfill protection. 4,537,212, Cl. 137-2.000.
Rogic, Milorad M.: *See*—
Van Der Puy, Michael; Kolc, Jaroslav F.; Anello, Louis G.; Hendrickson, Larry L.; Rogic, Milorad M.; and Swerdloff, Michael D., 4,537,614, Cl. 71-28.000.
Rohlfing, Raymond A.: *See*—
Peltzman, William S.; Rohlfing, Raymond A.; and Gates, Charles C., Jr., 4,537,736, Cl. 264-130.000.
Rohm GmbH Chemische Fabrik: *See*—
Heescher, Felix, 4,536,997, Cl. 52-86.000.
Rohm and Haas Company: *See*—
Isacoff, Eric G.; and Neely, James W., 4,537,683, Cl. 210-667.000.
Rohrback Corporation: *See*—
Waterman, David K., 4,537,071, Cl. 73-432.00R.
Rohrmann, Charles A.; and Fullam, Harold T., to Battelle Memorial Institute. Oxidation of hydrogen halides to elemental halogens. 4,537,835, Cl. 423-502.000.
Roller Bearing Company of America: *See*—
Hartl, Werner, 4,537,526, Cl. 403-370.000.
Rolls-Royce Inc.: *See*—
Nightingale, Douglas J., 4,537,026, Cl. 60-264.000.
Rolls-Royce Limited: *See*—
Simpson, Philip A., 4,537,066, Cl. 73-117.400.
Roman, Gianfranco, to Claber S.p.A. Portable winding device for flexible pipe, particularly for cars, caravans, coaches, crafts, balconies and small gardens. 4,537,215, Cl. 137-355.260.
Rombusch, Konrad; Maahs, Gunther; and Schafer, Wolfgang, to Chemische Werke Huels, AG. Quadratic acid amide derivatives, their use as stabilizers, and synthetic resins treated therewith. 4,537,924, Cl. 524-103.000.
Ronemus, DeHertburn N.; and Tice, Victor M., to Pass & Seymour, Inc. Electrical switch means particularly adapted to GFCI test and reset switches. 4,538,040, Cl. 200-159.00A.
Roney, Thomas W.; and Adams, Maynard L., to Clark Equipment Company. Safety seat. 4,537,446, Cl. 297-464.000.
Rooke, David J.; and Burnstead, Barry W., to Beecham Group Limited. Pharmaceutical formulation. 4,537,887, Cl. 514-197.000.
Rooney, Clarence S.: *See*—
Cragoe, Edward J., Jr.; Rooney, Clarence S.; and Williams, Haydn W. R., 4,537,902, Cl. 514-422.000.
Roper, Jerry M., to Ethyl Corporation. 4H-1-benzopyrans and lubricant compositions containing same. 4,537,920, Cl. 252-32.00R.
Roper, Ralph E., to Wallace Expanding Machines, Inc. Bearing burnishing method and apparatus. 4,536,931, Cl. 29-90.00R.
Rosen, Terry J.: *See*—
Firth, Bruce E.; and Rosen, Terry J., 4,538,008, Cl. 568-783.000.
Ross, Mark A., to Ross, Mark Anthony; and Hiseman, Robert Allen. Folding knife. 4,536,959, Cl. 30-161.000.
Ross, Mark Anthony: *See*—
Ross, Mark A., 4,536,959, Cl. 30-161.000.
Rossi, Albert; and Lewtas, Kenneth, to Exxon Research & Engineering Co. Additive concentrates for distillate fuels. 4,537,602, Cl. 44-62.000.
Rosslenbroich, Hans-Jurgen: *See*—
Naumann, Klaus; Scheinpflug, Hans; Rosslenbroich, Hans-Jurgen; and Paul, Volker, 4,537,888, Cl. 514-228.000.
Rostoker, William: *See*—
Galante, Jorge O.; and Rostoker, William, 4,536,894, Cl. 623-22.000.
Rothman, Ulf S. E.; and Jacobsson, Sten A. L., to Pharmacia Aktiebolag. Method for cleansing fluid discharging skin surfaces, wounds and mucous membranes and means for carrying out the method. 4,537,767, Cl. 424-78.000.
Rottgen, Karl; Stendel, Joachim; and Diskowski, Herbert, to Hoechst Aktiengesellschaft. Process for the electrothermal production of yellow phosphorus. 4,537,756, Cl. 423-323.000.
Roussel Uclaf: *See*—
Apostoweil, Peter; and Kok, Johannes A. G., 4,537,768, Cl. 424-89.000.

Tessier, Jean; Demoute, Jean-Pierre; and Cadiergue, Joseph, 4,537,897, Cl. 514-351.000.
Rowe International, Inc.: *See*—
Verduin, Lee C.; and St. Clair, Michael J., 4,537,336, Cl. 222-641.000.
Rowell, Jonathan M.: *See*—
VonGrunberg, Hubertus; Rowell, Jonathan M.; and Corey, Frederick C., 4,537,289, Cl. 188-97.400.
Roy, Della M.: *See*—
Komarneni, Sridhar; and Roy, Della M., 4,537,710, Cl. 252-628.000.
Ruby, Kenneth: *See*—
Fowler, Randall C.; Ruby, Kenneth; and Sartor, Thomas F., Jr., 4,537,484, Cl. 354-62.000.
Rudland, Peter E., to ITR International Timelimited. Identification card with concealed coding and a simple reader module to decode it. 4,538,059, Cl. 235-468.000.
Rudolph, Ronald M.: *See*—
Hense, Thomas R.; and Rudolph, Ronald M., 4,536,962, Cl. 33-516.000.
Ruelens, Remy F.: *See*—
Wuyts, Oscar; Ruelens, Remy F.; and Van Camp, Lucien J. M., 4,538,201, Cl. 361-124.000.
Ruhl, Gerald F., to Replicap Products, Inc. Production of molded plastic articles with artwork thereon. 4,537,739, Cl. 264-247.000.
Russ, Julio G.; and Barrom, Donna L., to Plough, Inc. Long-wearing eyeshadow compositions. 4,537,766, Cl. 424-63.000.
Russel, Matthew J., to Eastman Kodak Company. Copy sheet positioning apparatus. 4,537,493, Cl. 355-3.0SH.
Russell, Raymond L.: *See*—
Everman, Wayne F.; Lewis, D. Michael; and Russell, Raymond L., 4,537,584, Cl. 493-93.000.
Ryan, William J. Method and apparatus for cleaning tainted shellfish. 4,537,149, Cl. 119-4.000.
Rybicky, Jaroslav: *See*—
Kambanis, Stamatis M.; Berchem, Antoine; Gregoire, Dennis; and Rybicky, Jaroslav, 4,537,941, Cl. 527-403.000.
Ryckman, William D., Jr., to Black & Decker, Inc. Toaster oven. 4,538,049, Cl. 219-386.000.
S. A. Pebeyre: *See*—
Pebeyre, Pierre-Jean; Gleyze, Rene ; and Montant, Charles, 4,537,613, Cl. 71-5.000.
S. T. Dupont: *See*—
Brassoud, Gerard, 4,536,922, Cl. 24-265.00B.
Sabranski, Udo; and Orth, Hans, to Rheinmetall GmbH. Hollow-charge insert for armor-piercing projectile. 4,537,132, Cl. 102-307.000.
Sach, George S., to Smith Kline & French Laboratories Limited. 2-(3,5-Substituted-2-pyridylalkylamino)-5-oxopyridylmethyl-4-pyrimidones useful as histamine H_1-antagonists. 4,537,890, Cl. 514-272.000.
Sach, George S., to Smith Kline & French Laboratories Limited. 2-(3,5-Substituted-2-pyridylalkylamino)-5-benzyl-4-pyrimidones. 4,537,891, Cl. 514-272.000.
Sadamatsu, Hideaki; Inoue, Michihiro; Kanda, Akihiro; and Matsuzawa, Akira, to Matsushita Electric Industrial Co., Ltd. Method for making semiconductor device. 4,536,950, Cl. 29-578.000.
Sahachaisere, Somchai: *See*—
Argiropoulos, George D.; and Sahachaisere, Somchai, 4,537,681, Cl. 210-317.000.
Sahara, Kousuke: *See*—
Ooshiro, Takehiko; Iwasaki, Masayoshi; Sahara, Kousuke; Suzuki, Norio; Utsumi, Hitoshi; Miyake, Kazuo; and Aburatani, Kenji, 4,537,073, Cl. 73-602.000.
St. Clair, Michael J.: *See*—
Verduin, Lee C.; and St. Clair, Michael J., 4,537,336, Cl. 222-641.000.
Saint-Gobain Vitrage: *See*—
Cohen, Sabatino, 4,537,798, Cl. 427-166.000.
Saito, Kaneo, to Konishiroku Photo Industry Co., Ltd. Automatic developing machine. 4,537,485, Cl. 354-304.000.
Saito, Mitsuru: *See*—
Ueda, Hiroshi; Saito, Mitsuru; and Kajita, Hideo, 4,537,732, Cl. 264-1.100.
Saito, Seiji; Ayata, Naoki; Suzuki, Hidetoshi; Ozawa, Kunitaka; and Koumura, Noboru, to Canon Kabushiki Kaisha. Image processing apparatus. 4,538,182, Cl. 358-280.000.
Saito, Shigeo; and Nagata, Masayuki, to Sumitomo Electric Industries, Ltd. Method of manufacturing Al-stabilized superconductor. 4,537,642, Cl. 148-11.50Q.
Saito, Yuichi: *See*—
Takao, Hiroyoshi; Yamamoto, Keisaku; Imai, Akio; Yoshida, Nobuyuki; Furukawa, Hiroshi; Saito, Yuichi; and Okumura, Akio, 4,537,936, Cl. 525-236.000.
Saitoh, Shinichi: *See*—
Ogawa, Tetsuya; Saitoh, Shinichi; Inoi, Takeshi; Kato, Masaji; and Obara, Heitaro, 4,537,999, Cl. 568-584.000.
Sajima, Yasuo: *See*—
Asawa, Tatsuro; Sajima, Yasuo; and Iwamoto, Junjiro, 4,537,673, Cl. 204-253.000.
Sakaeda, Keiko: *See*—
Sashiki, Takashi; and Sakaeda, Keiko, 4,537,229, Cl. 141-83.000.
Sakaguchi, Hifumi: *See*—
Yamamura, Kazuomi; Ishihara, Hideo; Iwamoto, Yoshinao; Sakaguchi, Hifumi; Morita, Masao; and Izawa, Toshio, 4,537,530, Cl. 405-160.000.
Sakai, Tatsuo, to Fuji Jukogyo Kabushiki Kaisha. Intake passages in cylinder heads of an opposed six-cylinder engine. 4,537,163, Cl. 123-52.0MC.
Sakai, Toshiyasu; Hara, Masahiro; and Teraura, Nobuyuki, to Nippondenso Co., Ltd. Optical reading apparatus having a reading sensor of electronic scanning type. 4,538,060, Cl. 235-472.000.
Sakamoto, Masanori: *See*—
Miyamura, Masataka; Sakamoto, Masanori; and Nakajima, Yuko, 4,537,826, Cl. 428-328.000.
Sakata, Hideo: *See*—
Yamamoto, Takeshi; and Sakata, Hideo, 4,536,963, Cl. 33-178.00E.
Sakurai, Keiichi; Ishida, Hideaki; and Hanzawa, Kohtaro, to Casio Computer Co. Envelope control apparatus. 4,537,110, Cl. 84-1.260.
Sakurai, Koichi, to Sakuraya Corporation. Dish with a melody sounding function. 4,537,109, Cl. 84-1.030.
Sakurai, Masao: *See*—
Nishi, Yasuyuki; Sakurai, Masao; and Takagi, Masashi, 4,537,042, Cl. 62-208.000.
Sakuraya Corporation: *See*—
Sakurai, Koichi, 4,537,109, Cl. 84-1.030.
Sales Tools, Inc.: *See*—
Erickson, Edward C., 4,537,380, Cl. 248-460.000.
Salminen, Reijo K. Hockey stick having laminated blade structure. 4,537,398, Cl. 273-67.00A.
Sanborn, James R.; and Tieman, Charles H., to Shell Oil Company. Alpha-aminooxy isovalerate insecticides. 4,537,780, Cl. 514-464.000.
Sanders Associates, Inc.: *See*—
Liu, Dean-Yuan, 4,537,582, Cl. 493-38.000.
Sanders, Clifford; and Sanders, Joanne. Fishing lure. 4,536,987, Cl. 43-42.340.
Sanders, Joanne: *See*—
Sanders, Clifford; and Sanders, Joanne, 4,536,987, Cl. 43-42.340.
Sands, Thomas H.: *See*—
Anderson, Marie T.; Michel, Karl H.; and Sands, Thomas H., 4,537,777, Cl. 514-521.000.
Sankyo Company Limited: *See*—
Shiino, Kouji; Hashimoto, Nobuo; Wada, Shozo; Nakamura, Keijiro; Izumi, Akio; Sato, Toshio; and Matsui, Takashi, 4,537,648, Cl. 156-351.000.
Terahara, Akira; and Tanaka, Minoru, 4,537,859, Cl. 435-146.000.
Sannomiya, Kunio: *See*—
Otsuka, Hirotaka; Nakazato, Katsuo; Sannomiya, Kunio; Kawakami, Hidehiko; Tsuchiya, Hiroyoshi; and Uchida, Hideo, 4,538,184, Cl. 358-283.000.
Sano, Tetsuya: *See*—
Miyoshi, Motosuke; and Sano, Tetsuya, 4,538,065, Cl. 250-310.000.
Sanofi, S.A.: *See*—
Blanchard, Jean; and Panak, Edouard, 4,537,894, Cl. 514-301.000.
Sansome, Terry; and Simmel, Thomas L. Toy vehicle and track assembly. 4,537,577, Cl. 446-445.000.
Santilli, Arthur A.: *See*—
Scotese, Anthony C.; Morris, Robert L.; Santilli, Arthur A.; and Strike, Donald P., 4,537,968, Cl. 546-209.000.
Sapru, Krishna: *See*—
Ovshinsky, Stanford R.; Sapru, Krishna; and Liang, Gao, 4,537,674, Cl. 204-290.00R.
Saringer, John H., to Imasco-CDC Research Foundation. Device for imparting continuous passive motion to human joints. 4,537,083, Cl. 74-89.150.
Sartor, Thomas F., Jr.: *See*—
Fowler, Randall C.; Ruby, Kenneth; and Sartor, Thomas F., Jr., 4,537,484, Cl. 354-62.000.
Sasa, Hiroyuki, to Olympus Optical Co., Ltd. Device for cleaning endoscopes. 4,537,209, Cl. 134-166.00C.
Sasaki, Osamu: *See*—
Takahashi, Jiro; Sawada, Kiyoshi; Kinoshita, Akira; Komamura, Tawara; Goto, Satoshi; and Sasaki, Osamu, 4,537,847, Cl. 430-58.000.
Sasakura Engineering Co., Ltd.: *See*—
Minami, Kunihiko, 4,537,248, Cl. 165-113.000.
Sashiki, Takashi; and Sakaeda, Keiko, to Kabushiki Kaisha Ishida Koki Seisakusho. Automatic weighing apparatus and method. 4,537,229, Cl. 141-83.000.
Sato, Kazuyoshi: *See*—
Yamamoto, Susumu; and Sato, Kazuyoshi, 4,537,808, Cl. 428-36.000.
Sato, Shinsaku: *See*—
Tsunoda, Sachio; and Sato, Shinsaku, 4,537,558, Cl. 415-1.000.
Sato, Takahisa; Takata, Masahiro; Ueshima, Michio; and Nagai, Isao, to Nippon Shokubai Kagaku Kogyo Co Ltd. Catalyst for production of unsaturated aldehydes. 4,537,874, Cl. 502-311.000.
Sato, Toshihiko: *See*—
Asano, Masao; Fujimatsu, Wataru; Matsumoto, Kazumasa; Murata, Hideki; Sato, Toshihiko; and Watanabe, Kenji, 4,537,824, Cl. 428-323.000.
Sato, Toshio: *See*—
Shiino, Kouji; Hashimoto, Nobuo; Wada, Shozo; Nakamura, Keijiro; Izumi, Akio; Sato, Toshio; and Matsui, Takashi, 4,537,648, Cl. 156-351.000.
Satzler, Ronald L., to Caterpillar Tractor Co. Belt tensioning mechanism. 4,537,267, Cl. 180-9.100.
Saunders, Peter J., to Imperial Chemical Industries PLC. Apparatus for initiating explosions and method therefor. 4,537,131, Cl. 102-217.000.
Saur, Roland, to Behr-Thomson Degnstoffregler GmbH. Apparatus for cooling an internal combustion engine. 4,537,158, Cl. 123-41.100.

Sauter, Hubert: *See—*
Plath, Peter; Eicken, Karl; Sauter, Hubert; and Wuerzer, Bruno, 4,537,617, Cl. 71-92.000.

Savides, Christos; and Robertson, Allan J., to American Cyanamid Company. Bis(β-carboxyethyl)isobutyl, sec. butyl and t-butyl phosphine oxide and polyamides containing the same. 4,537,993, Cl. 568-14.000.

Sawada, Kiyoshi: *See—*
Takahashi, Jiro; Sawada, Kiyoshi; Kinoshita, Akira; Komamura, Tawara; Goto, Satoshi; and Sasaki, Osamu, 4,537,847, Cl. 430-58.000.

Sayama, Norio: *See—*
Nakamura, Hiromi; Takahashi, Takehiko; Narazaki, Norio; Yamamoto, Kazuo; and Sayama, Norio, 4,537,023, Cl. 60-39.050.

Scapa Inc.: *See—*
Albert, Hans, 4,537,658, Cl. 162-348.000.

Schachter, David; Abbott, Richard E.; and Cogan, Uri, to Columbia University in the City of New York. Impermeant spectroscopic probes. 4,537,718, Cl. 260-112.50R.

Schaetzer, Harry; Raisin, Helmut; and Mausezahl, Dieter, to Ciba-Geigy Corporation. Process for trichromatic dyeing or printing of polyamide. 4,537,598, Cl. 8-641.000.

Schafer, Karl: *See—*
Muller, Hanns P.; and Schafer, Karl, 4,537,596, Cl. 8-115.600.

Schafer, Wolfgang: *See—*
Rombusch, Konrad; Maahs, Gunther; and Schafer, Wolfgang, 4,537,924, Cl. 524-103.000.

Schaller, Werner, to Siemens Aktiengesellschaft. Mounting and contacting assembly for plate-shaped electrical device. 4,538,210, Cl. 361-401.000.

Schammel, Wayne P.: *See—*
Kilner, Peter H.; Egan, Joseph P., Jr.; Ceisel, Stephen G.; and Schammel, Wayne P., 4,537,978, Cl. 549-245.000.

Scharff, Karl-Heinz: *See—*
Burger, Arnulf; Scharff, Karl-Heinz; Geiger, Kurt; Schnee, Gunther; and Pieper, Hartwig, 4,536,909, Cl. 15-4.000.

Schatull, Wolfgang: *See—*
Sucrow, Wolfgang; Schatull, Wolfgang; and Fuss, Peter, 4,537,698, Cl. 252-299.610.

Schaum-Chemie W. Bauer GmbH & Co. KG: *See—*
Baumann, Heinz, 4,537,913, Cl. 521-107.000.

Schaus, John M., to Eli Lilly and Company. Method of preparing permissibly-substituted 1H(and 2H)pyrazolo[3,4-g]quinolines; pyrimido[4,5,g]quinolines; thiazolo[4,5,g]quinolines and intermediates therefore. 4,537,964, Cl. 544-250.000.

Schedlitzki, Dietmar: *See—*
Fock, Jurgen; and Schedlitzki, Dietmar, 4,537,934, Cl. 525-123.000.

Scheibengraber, Karl J., to General Electric Company. Reflective alignment light for computerized tomography. 4,538,289, Cl. 378-20.000.

Scheinpflug, Hans: *See—*
Naumann, Klaus; Scheinpflug, Hans; Rosslenbroich, Hans-Jurgen; and Paul, Volker, 4,537,888, Cl. 514-228.000.

Scheitz, John T.: *See—*
Brown, Vincent B.; Kozel, Charles A.; Scheitz, John T.; and Armando, John E., 4,537,456, Cl. 339-99.00R.

Schenkel, Jeffrey: *See—*
Phillipps, Patrick G.; and Schenkel, Jeffrey, 4,537,196, Cl. 128-630.000.

Schering Aktiengesellschaft: *See—*
Boroschewski, Gerhard; and Arndt, Friedrich, 4,537,622, Cl. 71-108.000.
Kreisel, Rudolf; and Meyer, Walter, 4,537,640, Cl. 134-18.000.

Schetina, Otto: *See—*
Zitz, Alfred; Schetina, Otto; and Wrulich, Herwig, 4,537,447, Cl. 299-1.000.

Schiestl, Randall L.: *See—*
Nicklas, Roger W.; Reynolds, John E.; and Schiestl, Randall L., 4,536,928, Cl. 29-1.200.

Schiffers, Hans-Gunter: *See—*
Jansen, Herbert; Schiffers, Hans-Gunter; and Gerretz, Richard, 4,537,407, Cl. 277-2.000.

Schindel, Hugo, to Rationator-Maschinenbau GmbH. Apparatus for moving dispensing pistons and filling tubes. 4,537,230, Cl. 141-146.000.

Schitka, Konstantin J.: *See—*
Borbely, Gyula J.; Devuyst, Eric A.; Ettel, Victor A.; Mosoiu, Marcel A.; and Schitka, Konstantin J., 4,537,686, Cl. 210-713.000.

Schlumberger Electronics (U.K.) Limited: *See—*
Lax, David R.; Page, Michael; and Johnstone, James S., 4,537,076, Cl. 73-662.000.

Schlumberger Technology Corporation: *See—*
Clark, Brian, 4,538,109, Cl. 324-338.000.

Schmid, Wolfgang; Wanner, Karl; Falchle, Jorg; Bleicher, Manfred; and Muller, Frank, to Robert Bosch GmbH. Power-driven hand tool. 4,537,264, Cl. 173-48.000.

Schmidt, Franz; Pipper, Gunter; Floss, Josef G.; and Zahradnik, Franz, to BASF Aktiengesellschaft. Continuous preparation of nylon with diamine recycling. 4,537,949, Cl. 528-335.000.

Schmidt, Heinrich, to Heinrich Greve GmbH. Apparatus for removing the waste edge pieces from punched blanks. 4,537,589, Cl. 493-373.000.

Schmidt, Steven L.: *See—*
Dorey, John K., II; Schmidt, Steven L.; and Townsend, Wesley P., 4,537,799, Cl. 427-259.000.

Schmitt, Marshall: *See—*
Puskas, Imre; and Schmitt, Marshall, 4,537,985, Cl. 560-96.000.

Schmukler, Seymour: *See—*
Adur, Ashok M.; Schmukler, Seymour; Maconis, John, Jr.; and Shida, Mitsuzo, 4,537,836, Cl. 428-522.000.

Schnee, Gunther: *See—*
Burger, Arnulf; Scharff, Karl-Heinz; Geiger, Kurt; Schnee, Gunther; and Pieper, Hartwig, 4,536,909, Cl. 15-4.000.

Schneider, Heinz-Walter; Richter, Wolfgang; Disteldorf, Walter; and Kummer, Rudolf, to BASF Aktiengesellschaft. Preparation of pure monoesters of adipic acid. 4,537,987, Cl. 560-193.000.

Schneider, Stanley: *See—*
Bielinski, Ralph F.; Chacon, M. Frank; Kramer, Dennis M.; Mathias, William R.; and Schneider, Stanley, 4,538,199, Cl. 361-93.000.

Schneider, William P., to Upjohn Company, The. Derivatives of leukotrienes A and C. 4,537,723, Cl. 260-400.000.

Schnyder, Erika. Toilet with flushing device and self-cleaning seat. 4,536,899, Cl. 4-233.000.

Schoeppel, Roger J.: *See—*
Terry, Lynn E.; and Schoeppei, Roger J., 4,537,031, Cl. 60-649.000.

Schoppmeyer, Johannes, to Dr.-Ing. Rudolf Hell GmbH. Screen systems for multicolor printing. 4,537,470, Cl. 350-317.000.

Schortmann, Walter E.; and Metrick, Dennis, to Kendall Company, The. Scrub-wipe fabric. 4,537,819, Cl. 428-284.000.

Schramm, Matthias: *See—*
Heiker, Fred R.; Stoltefuss, Jurgen; Franckowiak, Gerhard; Schramm, Matthias; Thomas, Gunter; and Gross, Rainer, 4,537,881, Cl. 514-25.000.

Schreder, Felix; Dorner, Leonhard; and Wilde, Eugen, to E.G.O. Elektro-Gerate Blanc U. Fischer. Heating element for heating boiling plates, hotplates and the like. 4,538,051, Cl. 219-466.000.

Schroder, Christine: *See—*
Greb, Wolfgang; Christophliemk, Peter; and Schroder, Christine, 4,537,771, Cl. 424-154.000.

Schuettenberg, Alexander D.: *See—*
Macdonell, Gary D.; Lindstrom, Merlin R.; Baldwin, Bernard A.; Louthan, Rector P.; and Schuettenberg, Alexander D., 4,537,690, Cl. 252-48.400.

Schuler, Chester L.: *See—*
Barker, Ronald C.; and Schuler, Chester L., 4,538,188, Cl. 360-14.300.

Schulthess, Dieter: *See—*
Gaisch, Helmut; Ghiste, Patrick D. L.; and Schulthess, Dieter, 4,537,204, Cl. 131-274.000.

Schultz, Fredrick W.: *See—*
Bero, Vernon L.; and Schultz, Fredrick W., 4,537,121, Cl. 99-450.400.

Schulz, Donald N.: *See—*
Hall, James E.; and Schulz, Donald N., 4,537,939, Cl. 526-179.000.

Schunemann, Klaus: *See—*
Szabo, Laszlo; and Schunemann, Klaus, 4,538,122, Cl. 331-96.000.

Schurter, Rolf; Fory, Werner; and Meyer, Willy, to Ciba Geigy Corporation. N-phenylsulfonyl-N'-pyrimidinylureas. 4,537,618, Cl. 71-92.000.

Schwartz, Edwin; and Frees, David. Anti-knock liquid flow control valve. 4,537,216, Cl. 137-514.000.

Schwartz, Erich: *See—*
Oppenlaender, Knut; Fikentscher, Rolf; Buettner, Egon; Slotman, Wilhelmus; Schwartz, Erich; and Mohr, Rudolf, 4,537,701, Cl. 252-344.000.

Schwarz, Albrecht: *See—*
Morris, David; and Schwarz, Albrecht, 4,538,219, Cl. 363-26.000.

Schwarz, Hans G., to Polyflex Schwarz GmbH & Co. High-pressure hose and method for the manufacture of same. 4,537,222, Cl. 138-130.000.

Schwarze, Rigobert. Pipe bending machine. 4,537,053, Cl. 72-157.000.

SCM Corporation: *See—*
Percel, Phillip J.; and Perkins, Douglas W., 4,537,784, Cl. 426-303.000.

Scotese, Anthony C.; Morris, Robert L.; Santilli, Arthur A.; and Strike, Donald P., to American Home Products Corporation. Thiophene derivatives with antisecretory activity. 4,537,968, Cl. 546-209.000.

Scott, Francis L.: *See—*
Ogunbiyi, Lai; Scott, Francis L.; and Smith, Francis X., 4,537,746, Cl. 422-28.000.

Scott, Gordon C.: *See—*
Brinkhoff, Carl H.; and Scott, Gordon C., 4,536,892, Cl. 2-424.000.

Scott, Joseph A.: *See—*
Alexander, Robert L.; Bequette, Robert J.; Kensler, Terry T.; and Scott, Joseph A., 4,537,883, Cl. 514-110.000.

Scott, Melvin: *See—*
Edge, David J.; Naik, Appaya R.; and Scott, Melvin, 4,537,709, Cl. 252-558.000.

Scott, Robert T. Earplug. 4,537,187, Cl. 128-151.000.

Scott, Tommy L.; and Moss, Morris C. Security locking bolt. 4,537,543, Cl. 411-371.000.

Secunda, Jeffrey A.: *See—*
Burroughs, Robert H.; Wright, John D.; Secunda, Jeffrey A.; and Newbower, Ronald S., 4,537,128, Cl. 101-407.0BP.

Sedco, Inc.: *See—*
Hampton, James E., 4,537,533, Cl. 405-227.000.

Sedlmair, Gerhard J.: *See—*
Knabel, Walter R.; and Sedlmair, Gerhard J., 4,537,418, Cl. 280-605.000.

See, Francis R.: *See—*
Coe, Jerry R.; Pearce, Godfrey R.; and See, Francis R., 4,538,025, Cl. 174-52.00S.
SEEQ Technology, Inc.: *See—*
Smarandoiu, George; and Perlegos, George, 4,538,245, Cl. 365-200.000.
Seifert, Hermann: *See—*
Feyen, Peter; Seifert, Hermann; and Kohler, Egon, 4,537,730, Cl. 260-989.000.
Seiler, Claus-Dietrich; and Vahlensieck, Hans-Joachim, to Dynamit Nobel AG. Method of preparing 2-phenylethylchlorosilanes. 4,537,983, Cl. 556-479.000.
Seita, Toru: *See—*
Oogai, Michiharu; Seita, Toru; Takeshige, Kosuke; and Shuyama, Hideo, 4,537,910, Cl. 521-27.000.
Sekoguchi, Kotohiko; and Sonoda, Yoshiteru, to Sekoguchi, Kotohiko; and Fujikin International, Inc. Precision pressure gauge. 4,537,078, Cl. 73-744.000.
Sengoku, Kouji: *See—*
Sugisawa, Ko; Matsumura, Yasushi; Taga, Kazumitsu; Sengoku, Kouji; and Nagatome, Yoshiaki, 4,537,789, Cl. 426-634.000.
Senki Medical Instrument Mfg. Co., Ltd.: *See—*
Phuc, Tran N., 4,537,188, Cl. 128-200.210.
Seno, Eugene T.: *See—*
Baltz, Richard H.; Wild, Gene M.; and Seno, Eugene T., 4,537,957, Cl. 336-7.100.
Sensormedics Corporation: *See—*
Luper, Charles R., 4,537,058, Cl. 73-1.00G.
Seppelt, Wolfgang: *See—*
Seufert, Walter; Varwig, Juergen; Seppelt, Wolfgang; and Adolphi, Heinrich, 4,537,884, Cl. 514-127.000.
Sepulveda, Frank J.; and Silva, Robert R., to Reid, Robert E., a part interest. Louvering overhead sectional door. 4,537,237, Cl. 160-201.000.
Sequeira, Hermann B.; and Taylor, Jay E., to University of Delaware. Direct modulation of injection lasers. 4,538,276, Cl. 372-26.000.
Ser, Jean-Claude: *See—*
Millet, Catherine; Ser, Jean-Claude; and N'Guyen, Quang L., 4,537,782, Cl. 514-774.000.
Seregi, Andras: *See—*
Deak, Gyula; Zara nee Kaczian, Erzsebet; Gyorgy, Lajos; Fekete, Marton; Doda, Margit; Seregi, Andras; Kanyicska, Bela; Toth nee Pecsi, Erzsebet; Horvath nee Gaal, Maria; Manyai, Sandor; Gorgenyi, Frigyes; and Vaszovics nee Reichmann, Gyorgyi, 4,537,895, Cl. 514-307.000.
Sermatech International, Inc.: *See—*
Mosser, Mark F., 4,537,632, Cl. 106-14.120.
Seshadri, Jayaram; and Neimy, Daniel T., to Thermo King Corporation. Truck transport refrigeration unit. 4,537,047, Cl. 62-510.000.
Seufert, Walter; Varwig, Juergen; Seppelt, Wolfgang; and Adolphi, Heinrich, to BASF Aktiengeellschaft. 2-Trifluoromethylphenyl (di)thiophosphates, and their use for pest control. 4,537,884, Cl. 514-127.000.
Severson, Roland G., Jr., to Procter & Gamble Company, The. Liquid detergents containing boric acid to stabilize enzymes. 4,537,706, Cl. 252-545.000.
Severson, Roland G., Jr., to Procter & Gamble Company, The. Liquid detergents containing boric acid and formate to stabilize enzymes. 4,537,707, Cl. 252-545.000.
Seyler, Jay K.: *See—*
Orlowski, Ronald C.; and Seyler, Jay K., 4,537,716, Cl. 260-112.50T.
Shaikh, Maqboolhusein G., to A. O. Smith Corp. Power connection apparatus having integrated surge arrestor. 4,538,200, Cl. 361-117.000.
Shalhoob, William N.; and Kaspaul, Alfred F., to Hydromagnetics, Inc. Hydromagnetic apparatus for non-surgical in vivo removal of calcium deposits. 4,537,181, Cl. 128-1.300.
Shambroom, John R.; and Sliski, Alan P., to Control Data Corporation. Capacitance height gage applied in reticle position detection system for electron beam lithography apparatus. 4,538,069, Cl. 250-491.100.
Shanklin Corporation: *See—*
Shanklin, Frank G.; and King, Francis X. (said Francis Xavier King, Jr. assors. to), 4,537,016, Cl. 53-493.000.
Shanklin, Frank G.; and King, Francis X., to Shanklin Corporation, by said Francis Xavier King, Jr. Horizontal form, fill, seal machines. 4,537,016, Cl. 53-493.000.
Shanton, Kenneth J., to Wiggins Teape Group Limited, The. Process for the production of record material. 4,537,797, Cl. 427-150.000.
Sharp, Harper E.; Spiegel, Leo; Masters, Richard M.; Frey, Elmer J.; Howatt, John R.; and Walker, Gary E., to Wilson Industries, Inc. Inertial borehole survey system. 4,537,067, Cl. 73-151.000.
Sharp Kabushiki Kaisha: *See—*
Iwagami, Kenji; and Yamamoto, Hachizou, 4,538,057, Cl. 235-379.000.
Sharp, Russell G.: *See—*
Wilkinson, William R.; and Sharp, Russell G., 4,537,311, Cl. 206-529.000.
Sharpe, Raymond; Griffiths, Trevor J.; and Hunt, Peter, to Lucas Industries Limited. Couplings. 4,537,578, Cl. 464-31.000.
Shea, Donald M.: *See—*
Wyle, Charles; Shea, Donald M.; and Best, Norman D., 4,536,935, Cl. 29-281.100.
Shedigian, Vandos, to Emhart Industries, Inc. Dielectric fluid for a capacitor. 4,538,206, Cl. 361-315.000.
Shedigian, Vandos, to Emhart Industries, Inc. Dielectric fluid for a capacitor. 4,538,207, Cl. 361-317.000.
Shedigian, Vandos, to Emhart Industries, Inc. Alternating current capacitor. 4,538,208, Cl. 361-319.000.
Sheffield, Gerald W.: *See—*
Petersen, Oscar J.; Barton, Ross J.; Dalke, Jack E.; Sheffield, Gerald W.; and Towle, Theodore, 4,537,384, Cl. 251-83.000.
Shell Oil Company: *See—*
Rogers, Colin C.; Baker, John N.; and Estebanez, Joseph, 4,537,212, Cl. 137-2.000.
Sanborn, James R.; and Tieman, Charles H., 4,537,780, Cl. 514-464.000.
Simpson, Wayne F., 4,537,528, Cl. 405-72.000.
Todd, David B., 4,537,257, Cl. 166-369.000.
Shenvi, Ashokkumar B., to Du Pont de Nemours, E. I., and Company. α-Aminoboronic acid derivatives. 4,537,773, Cl. 514-63.000.
Shenvi, Ashokkumar B., to Du Pont de Nemours, E. I., and Company. Intermediates for octahydrobenzofuro[3,2-E]isoquinolines. 4,537,963, Cl. 546-66.000.
Sheridon, Nicholas K., to Xerox Corporation. Fluid jet assisted ion projection and printing apparatus. 4,538,163, Cl. 346-155.000.
Sherman, Michael I., to Kamyr, Inc. Hot water drying of low rank coal. 4,536,969, Cl. 34-9.000.
Sherman, Randy J.; and Hanson, Derald F., to Lincoln Laser Company. Apparatus with two input beams for generating optical scans. 4,537,465, Cl. 350-68.000.
Sherrard, Muriel. Compact ornament. 4,537,806, Cl. 428-7.000.
Shewchuk, W. Donald. Bag holder. 4,537,377, Cl. 248-99.000.
Shiba, Kazuo: *See—*
Shimizu, Masami; Yoshikawa, Hisao; Kimura, Sosaku; Shiba, Kazuo; Maeno, Fumio; Fuwa, Shigehiro; and Mihara, Kuniyuki, 4,536,993, Cl. 51-165.800.
Shibata, Yoji: *See—*
Nakajima, Hirohito; Haji, Katsumi; Shibata, Yoji; and Kosuge, Wataru, 4,538,176, Cl. 358-86.000.
Shida, Mitsuzo: *See—*
Adur, Ashok M.; Schmukler, Seymour; Maconis, John, Jr.; and Shida, Mitsuzo, 4,537,836, Cl. 428-522.000.
Shiiki, Zenya: *See—*
Kawakami, Yukichika; Shiiki, Zenya; and Iizuka, Yo, 4,537,953, Cl. 528-388.000.
Shiino, Kouji; Hashimoto, Nobuo; Wada, Shozo; Nakamura, Keijiro; Izumi, Akio; Sato, Toshio; and Matsui, Takashi, to Sankyo Company Limited; and Fuji Electric Company Ltd. Automatic specimen sealing system. 4,537,648, Cl. 156-351.000.
Shikatani, Yutaka: *See—*
Matsuura, Kazuo; Shikatani, Yutaka; Kamiishi, Hirofumi; Kuroda, Nobuyuki; and Miyoshi, Mituji, 4,537,938, Cl. 526-97.000.
Shimada, Hiroshi, to Fujitsu Limited. Level converter circuit. 4,538,076, Cl. 307-475.000.
Shimada, Kiyoshi: *See—*
Kimura, Akira; Ishihama, Masao; Abe, Toshiro; Shimada, Kiyoshi; and Matsui, Shinichi, 4,537,275, Cl. 180-300.000.
Shimago, Kozo: *See—*
Takahashi, Takeo; Shimago, Kozo; and Maeshima, Kaoru, 4,537,973, Cl. 548-303.000.
Shimizu Construction Co., Ltd., The: *See—*
Tsubonuma, Yoshio; and Kawai, Tohru, 4,537,536, Cl. 405-267.000.
Shimizu, Koichi: *See—*
Kunimi, Nobuo; Shimizu, Koichi; and Suzuki, Toshiro, 4,538,114, Cl. 330-253.000.
Shimizu, Masaki; Sudo, Tadashi; and Nomura, Takeo, to Terumo Corporation. Hot-water extracts of neem bark. 4,537,774, Cl. 424-195.100.
Shimizu, Masami; Yoshikawa, Hisao; Kimura, Sosaku; Shiba, Kazuo; Maeno, Fumio; Fuwa, Shigehiro; and Mihara, Kuniyuki, to Citizen Watch Company Limited. Grinding machine. 4,536,993, Cl. 51-165.800.
Shimizu, Toshio: *See—*
Tsukui, Tsutomu; Shimizu, Toshio; Doi, Ryota; and Tsutsumi, Yasuyuki, 4,537,840, Cl. 429-33.000.
Shimpo, Tetsuhiko; and Fujihata, Isao, to Nippon Chemi-Con Corporation. Power supply device. 4,538,101, Cl. 323-272.000.
Shin-Etsu Chemical Co. Ltd.: *See—*
Mori, Shigeru; Kudo, Yoshiaki; and Kuwata, Satoshi, 4,537,691, Cl. 252-49.600.
Shinohara, Toshihide; and Okazaki, Sakiho, to Kabushiki Kaisha Suwa Seikosha. Progressive multifocal ophthalmic lens. 4,537,479, Cl. 351-169.000.
Shinryo, Yuko; and Yamamoto, Takashi, to Mitsubishi Denki Kabushiki Kaisha. Preparation of laminated iron core of electric device. 4,536,952, Cl. 29-596.000.
Shirai, Tetsuaki, to Kawasaki Jukogyo Kabushiki Kaisha. Air cleaner for an air-cooled engine. 4,537,160, Cl. 123-41.580.
Shiramizu, Takami, to Victor Company of Japan, Limited. Electronic musical instrument having variable frequency dividers. 4,537,108, Cl. 84-1.010.
Shishido, Tomio: *See—*
Tanaka, Masaho; Shishido, Tomio; Fukuhara, Tetsukazu; Yao, Yugo; Kobayashi, Kunihilo; and Inoue, Yoshio, 4,538,042, Cl. 219-58.000.
Shishido, Yoshio, to Olympus Optical Co., Ltd. Focusing detecting device with coaxial source and detector. 4,538,062, Cl. 250-201.000.
Shishikura, Toshikazu; Konuma, Hiroshi; Nakamura, Hidenori; and Kobayashi, Yukio, to Showa Denko Kabushiki Kaisha; and Hitachi, Ltd. Secondary battery. 4,537,843, Cl. 429-197.000.

Shook, Forrest A., to NLB Corp. Method for cleaning weld smut from a surface. 4,537,639, Cl. 134-10.000.

Short, Robert S.; and Utter, Mark S. Sound inhibitor for audio transducers. 4,538,296, Cl. 381-72.000.

Showa Denko Kabushiki Kaisha: *See*—
Shishikura, Toshikazu; Konuma, Hiroshi; Nakamura, Hidenori; and Kobayashi, Yukio, 4,537,843, Cl. 429-197.000.

Shum, Wilfred P.; White, John F.; and Beals, Eva M., to Atlantic Richfield Company. Process for the oxidation of isobutylene oxide to methacrolein. 4,537,998, Cl. 568-483.000.

Shum, Ying: *See*—
Wang, Samuel T.; Hu, Chenming; and Shum, Ying, 4,538,246, Cl. 365-226.000.

Shupe, Richard D.: *See*—
Black, John W.; Shupe, Richard D.; and Simon, Earl, 4,537,570, Cl. 425-450.100.

Shuskus, Alexander J.; and Cowher, Melvyn E., to United Technologies Corporation. Method for removing semiconductor layers from salt substrates. 4,537,651, Cl. 156-613.000.

Shuyama, Hideo: *See*—
Oogai, Michiharu; Seita, Toru; Takeshige, Kosuke; and Shuyama, Hideo, 4,537,910, Cl. 521-27.000.

Siegrist, Gary D.; and Blain, Edward S., to Sundstrand Corporation. Torsionally stiff lightweight refrigerator/freezer door. 4,536,990, Cl. 49-501.000.

Siemens Aktiengesellschaft: *See*—
Barnicol-Ottler, Max; Loczenski, Martin; Mieschke, Norbert; Ott, Gerhard; Przybylski, Gerhard; and Weber, Dietmar, 4,538,022, Cl. 174-113.00R.
Douklias, Nikolaos; and Grabmaier, Josef, 4,537,611, Cl. 65-18.200.
Eith, Gerhard, 4,537,354, Cl. 239-102.000.
Hassler, Heinrich; Muller, Reiner; Kippenberg, Horst; and Prolss, Norbert, 4,537,745, Cl. 420-590.000.
Immler, Josef; and van der Sel, Cornelis, 4,538,072, Cl. 250-568.000.
Kehrer, Hans-Peter; Villain, Juergen; and Reiff, Werner, 4,537,793, Cl. 427-35.000.
Keller, Wolfgang, 4,538,279, Cl. 373-139.000.
Kern, Hans, 4,538,096, Cl. 318-314.000.
Rekewitz, Rudolf; and Wambach, Hermann, 4,537,521, Cl. 400-637.600.
Schaller, Werner, 4,538,210, Cl. 361-401.000.
Vertenten, Edward; and Heft, Josef, 4,537,455, Cl. 339-99.00R.
Wirth, Wulf D., 4,538,152, Cl. 343-5.0VQ.
Zehner, Bernd, 4,538,243, Cl. 365-49.000.

Siemers, Paul A.; Kopp, Robert W.; and Jackson, Melvin R., to General Electric Company. Method for controlling dimensions of RSPD articles. 4,537,742, Cl. 419-8.000.

SIG Societe Industrielle Suisse: *See*—
Jaquet, Andre , 4,538,061, Cl. 250-201.000.

Silicon Technology: *See*—
Steere, Robert E., Jr.; and Lewandowski, Thomas, 4,537,177, Cl. 125-13.00R.

Silva, Robert R.: *See*—
Sepulveda, Frank J.; and Silva, Robert R., 4,537,237, Cl. 160-201.000.

Silver, Howard F.; and Miller, Ronald L., to In-Situ, Inc. Upgraded solvents in coal liquefaction processes. 4,537,675, Cl. 208-8.0LE.

Simmel, Thomas L.: *See*—
Sansome, Terry; and Simmel, Thomas L., 4,537,577, Cl. 446-445.000.

Simon, Earl: *See*—
Black, John W.; Shupe, Richard D.; and Simon, Earl, 4,537,570, Cl. 425-450.100.

Simon, Virgil S.; Adenau, Marvin L.; and Skalski, John S., to Thomas A. Schutz Co., Inc. Modular display for cigarette packs. 4,537,316, Cl. 211-133.000.

Simpson, Philip A., to Rolls-Royce Limited. Aeroengine test cells. 4,537,066, Cl. 73-117.400.

Simpson, Wayne F., to Shell Oil Company. Fireproof boom. 4,537,528, Cl. 405-72.000.

Sinclair, Robert A.: *See*—
Brown-Wensley, Katherine A.; and Sinclair, Robert A., 4,537,942, Cl. 528-12.000.

Singh, Pushpa: *See*—
O'Sullivan, Joseph; Aklonis, Carol A.; and Singh, Pushpa, 4,537,858, Cl. 435-119.000.

Singleton, Mary L.: *See*—
Reasor, Warren; and Singleton, Mary L., 4,537,438, Cl. 296-17.000.

Sinniger, Joseph O.; and Peterson, Richard M., to RCA Corporation. Multiplex bus system for controlling the transmission of data between a master control unit and a plurality of remotely located receiver-transmitter units. 4,538,262, Cl. 370-85.000.

Skalski, John S.: *See*—
Simon, Virgil S.; Adenau, Marvin L.; and Skalski, John S., 4,537,316, Cl. 211-133.000.

Skardal, Karl A. Vortex cleaner. 4,537,314, Cl. 209-211.000.

SKF Kugellagerfabriken GmbH: *See*—
Brandenstein, Manfred; and Hans, Rudiger, 4,537,270, Cl. 180-70.100.

Skinner, Robert T. J., to Lucas Industries, p.l.c. Fuel injection nozzles. 4,537,359, Cl. 239-533.600.

Skipor, Eugene, Jr.: *See*—
Kiamco, Roberto C.; and Skipor, Eugene, Jr., 4,537,390, Cl. 270-53.000.

Slavin, Michael; and Miller, Ellsworth S., to Lectron Products, Inc. Electric wiring terminal and method of making same. 4,538,045, Cl. 219-91.210.

Slee, Robert K., to South London Electrical Equipment Company Limited. Apparatus for feeding components to a work station. 4,537,552, Cl. 414-222.000.

Sliski, Alan P.: *See*—
Shambroom, John R.; and Sliski, Alan P., 4,538,069, Cl. 250-491.100.

Slob, Arie: *See*—
Te Velde, Ties S.; and Slob, Arie, 4,536,948, Cl. 29-577.00C.

Slongo, Mario; and Karrer, Friedrich, to Ciba Geigy Corporation. Polyalkylpiperidinesulfonic acid esters. 4,537,923, Cl. 524-100.000.

Slotman, Wilhelmus: *See*—
Oppenlaender, Knut; Fikentscher, Rolf; Buettner, Egon; Slotman, Wilhelmus; Schwartz, Erich; and Mohr, Rudolf, 4,537,701, Cl. 252-344.000.

Small Waters, Inc.: *See*—
Horton, Jerry L., 4,537,144, Cl. 114-61.000.

Smarandoiu, George; and Perlegos, George, to SEEQ Technology, Inc. Enabling circuit for redundant word lines in a semiconductor memory array. 4,538,245, Cl. 365-200.000.

Smeiman, Wilfred. Process and apparatus for rejuvenating electrostatic copy machine toner. 4,537,850, Cl. 430-137.000.

Smialowicz, Dennis T.: *See*—
Petersen, Arthur W.; and Smialowicz, Dennis T., 4,537,638, Cl. 134-2.000.

Smit, Jan W.: *See*—
Verschoof, Karel J. H.; and Smit, Jan W., 4,537,186, Cl. 128-130.000.

Smith, Dennis W.: *See*—
Borrelli, Nicholas F.; Hares, George B.; Smith, Dennis W.; and Wedding, Brent M., 4,537,612, Cl. 65-30.110.

Smith, Francis X.: *See*—
Ogunbiyi, Lai; Scott, Francis L.; and Smith, Francis X., 4,537,746, Cl. 422-28.000.

Smith, James A.; and Murphy, Betty J., to Creative Products Resource Associates, Ltd. Floor cleaning and waxing composition. 4,537,914, Cl. 521-111.000.

Smith Kline & French Laboratories Limited: *See*—
Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,537,779, Cl. 514-275.000.
Sach, George S., 4,537,890, Cl. 514-272.000.
Sach, George S., 4,537,891, Cl. 514-272.000.

Smith, Robert A.: *See*—
Gloth, Richard E.; Tazuma, James J.; and Smith, Robert A., 4,537,952, Cl. 528-392.000.

Smith, Roger D.; and Baer, Harold J. Game apparatus. 4,537,401, Cl. 273-112.000.

Smith, William R.; and Myers, Theodore R., to Motorola, Inc. Integrated alternator bridge heat sink. 4,538,169, Cl. 357-76.000.

Smola, Raymond L.: *See*—
Woodrow, Harold E.; and Smola, Raymond L., 4,537,055, Cl. 72-235.000.

SMS Schloemann - Siemag, Inc.: *See*—
Heffentrager, Joel L., 4,537,056, Cl. 72-238.000.

SMW Schneider & Weisshaupt GmbH: *See*—
Hiestand, Karl, 4,537,410, Cl. 279-4.000.

Snitman, David L.; Haslanger, Martin F.; and Sprague, Peter W., to E. R. Squibb & Sons, Inc. Compositions of 7-oxabicycloheptane and 7-oxabicycloheptene compounds and a method for their use in inhibiting bronchoconstriction. 4,537,904, Cl. 514-469.000.

Snitman, David L.; Haslanger, Martin F.; and Sprague, Peter W., to E. R. Squibb & Sons, Inc. 7-Oxabicycloheptane and 7-oxabicycloheptene compounds. 4,537,981, Cl. 549-463.000.

Snyder, Clair W., Jr.: *See*—
Douty, George H.; Landis, John M.; and Snyder, Clair W., Jr., 4,537,454, Cl. 339-45.00M.

Snyder, James K.: *See*—
Matteucci, John S.; Snyder, James K.; and Hahn, Robert E., 4,536,998, Cl. 52-171.000.

Snyder, Thomas S.: *See*—
Murray, Alexander P.; and Snyder, Thomas S., 4,537,666, Cl. 204-129.950.

Societe a Responsabilite Limitee styled: Speri-France: *See*—
Guillaume, Jean-Luc, 4,537,817, Cl. 428-260.000.

Societe Anonyme dite: L'Oreal: *See*—
Millet, Catherine; Ser, Jean-Claude; and N'Guyen, Quang L., 4,537,782, Cl. 514-774.000.

Societe Chimique des Charbonnages S.A.: *See*—
Bujadoux, Karel; and Neyer, Jean-Marie, 4,537,868, Cl. 502-104.000.

Societe Europeenne de Propulsion: *See*—
Delle-Vedove, Daniel; Lallemand, Yves; and Hubert, Olivier, 4,537,201, Cl. 128-697.000.

Societe Francaise des Produits pour Catalyse Pro-Catalyse: *See*—
Toulhoat, Herve ; Plumail, Jean-Claude; Mercier, Marc; and Jacquin, Yves, 4,537,875, Cl. 502-314.000.

Societe J. Brochier & Fils: *See*—
Bompard, Bruno P.; and Bruyere, Alain, 4,536,930, Cl. 29-33.00K.

Societe Nationale Industrielle Aerospatiale: *See*—
Barnoin, Pierre; Mens, Jacques M. N.; and Merle, Gilbert, 4,537,374, Cl. 244-102.00R.

Soden, Laurence M.; and West, John B. Building structure. 4,536,996, Cl. 52-67.000.

Sogabe, Masatoyo: *See*—
Kawada, Shigeki; Amemiya, Yoichi; Sogabe, Masatoyo; and Iwamatsu, Noboru, 4,538,084, Cl. 310-217.000.
Sokolovsky, Paul J., to Advanced Micro Devices, Inc. Automatic brushing machine. 4,537,059, Cl. 73-7.000.
Solar Turbines, Incorporated: *See*—
Grosjean, William C., 4,537,024, Cl. 60-39.161.
Soled, Stuart L.: *See*—
Fiato, Rocco A.; Soled, Stuart L.; and Montagna, Angelo A., 4,537,867, Cl. 502-74.000.
Somet Societa' Meccanica Tessile S.p.A.: *See*—
Viscardi, Ettore, 4,537,228, Cl. 139-453.000.
Somorai, Tamas: *See*—
Horvath, Istvan; Lang, Tibor; Pongo, Laszlo ; Reiter, Jozsef; Somorai, Tamas; Szilagyi, Geza; and Toldy, Lajos, 4,537,899, Cl. 514-384.000.
Sone, Junichi, to Nippon Electric Co., Ltd. Circuit utilizing Josephson effect. 4,538,077, Cl. 307-476.000.
Soneda, Mitsuo; Maekawa, Toshikazu; and Otsu, Kouji, to Sony Corporation. Shift register circuit with multiple, tapped outputs having pull-down transistors. 4,538,288, Cl. 377-76.000.
Sonoda, Yoshiteru: *See*—
Sekoguchi, Kotohiko; and Sonoda, Yoshiteru, 4,537,078, Cl. 73-744.000.
Sony Corporation: *See*—
Iwase, Seiichiro; and Komori, Shinichi, 4,538,172, Cl. 358-13.000.
Nanjo, Yusuke, 4,537,476, Cl. 350-461.000.
Soneda, Mitsuo; Maekawa, Toshikazu; and Otsu, Kouji, 4,538,288, Cl. 377-76.000.
Sony/Tektronix Corporation: *See*—
Miki, Yasuhiko, 4,538,266, Cl. 371-15.000.
SORMA S.r.l.: *See*—
Pieri, Vincenzo, 4,537,006, Cl. 53-134.000.
Souda, Keiichi: *See*—
Suzuki, Akihiro; Souda, Keiichi; Kuno, Masao; and Ikuta, Hiroshi, 4,538,191, Cl. 360-88.000.
Soundaranathan, Kasivisvanatha: *See*—
Gray, Bruce; Soundaranathan, Kasivisvanatha; and VanGieson, Franklin D., 4,536,945, Cl. 29-571.000.
South London Electrical Equipment Company Limited: *See*—
Slee, Robert K., 4,537,552, Cl. 414-222.000.
Sovonics Solar Systems: *See*—
Nath, Prem; Hoffman, Kevin R.; and Laarman, Timothy D., 4,537,795, Cl. 427-39.000.
Spectron Development Laboratories, Inc.: *See*—
Hess, Cecil, 4,537,507, Cl. 356-336.000.
Spectron Glass and Electronics, Incorporated: *See*—
Beitzer, George W., 4,536,967, Cl. 33-366.000.
Spengler, William E.; and Ramsey, William C., to Tolco Corporation. Portable pressure sprayer. 4,537,334, Cl. 222-401.000.
Speranza, Donald, to Eaton Corporation. Low-power acoustic injector drive circuit with enhanced turn-on. 4,537,353, Cl. 239-102.000.
Sperry Corporation: *See*—
Beck, Franklin L., 4,537,382, Cl. 248-568.000.
Spicer, Denis F., to Texas Instruments Incorporated. Magnetic quadripole. 4,538,127, Cl. 335-210.000.
Spiegel, Leo: *See*—
Sharp, Harper E.; Spiegel, Leo; Masters, Richard M.; Frey, Elmer J.; Howatt, John R.; and Walker, Gary E., 4,537,067, Cl. 73-151.000.
Spinelli, Gene A. Exercise device. 4,537,395, Cl. 272-123.000.
Spinelli, Richard A.: *See*—
Ritter, Joachim A.; Bock, Edward C.; Spinelli, Richard A.; and Dennis, John R., 4,537,499, Cl. 355-58.000.
Spitzer, Wayne A., to Eli Lilly and Company. Inotropic agents. 4,537,889, Cl. 514-243.000.
Spooner, Peter D.: *See*—
Bryant, Greyham F.; Spooner, Peter D.; and Pearson, William K. J., 4,537,050, Cl. 72-8.000.
Sposini, Maurizio: *See*—
Gabrielli, Luciano; and Sposini, Maurizio, 4,538,263, Cl. 370-86.000.
Sprague Electric Company: *See*—
Montgomery, William P., 4,538,212, Cl. 361-433.000.
Nguyen, Trung H.; and Hutchins, Clinton E., 4,537,665, Cl. 204-29.000.
Novacek, William G., 4,537,664, Cl. 204-28.000.
Richards, Oliver L., Jr., 4,538,300, Cl. 455-161.000.
Sprague, Peter W.: *See*—
Snitman, David L.; Haslanger, Martin F.; and Sprague, Peter W., 4,537,904, Cl. 514-469.000.
Snitman, David L.; Haslanger, Martin F.; and Sprague, Peter W., 4,537,981, Cl. 549-463.000.
Sprecker, Mark A.; Wiegers, Wilhelmus J.; Belko, Robert P.; and Boden, Richard M., to International Flavors & Fragrances Inc. Alkyl substituted and unsubstituted para-carboalkoxy cyclohexanones and organoleptic uses thereof. 4,537,704, Cl. 252-522.00R.
Square D Company: *See*—
Zylstra, Henry J.; and Jansen, Harley W., 4,538,194, Cl. 361-42.000.
Sta-Rite Industries, Inc.: *See*—
Argiropoulos, George D.; and Sahachaisere, Somchai, 4,537,681, Cl. 210-317.000.
Staehlin, John H., to Westinghouse Electric Corp. Antenna stow mechanism. 4,538,154, Cl. 343-705.000.
Stahlecker, Fritz, to Stahlecker, Hans; and Stahlecker, Fritz. Adjustable bearing support for open-end friction spinning rollers. 4,537,022, Cl. 57-401.000.
Stahlecker, Hans: *See*—
Stahlecker, Fritz, 4,537,022, Cl. 57-401.000.
Stahly, G. Patrick, to Ethyl Corporation. Aromatic coupling process. 4,538,004, Cl. 568-707.000.
Stahly, G. Patrick, to Ethyl Corporation. Aromatic coupling process. 4,538,005, Cl. 568-707.000.
Stahly, G. Patrick, to Ethyl Corporation. Aromatic coupling process. 4,538,006, Cl. 568-707.000.
Stamvik, Anders R.; Kristensson, Sten K.; and Lundvall, Karl-Erik, to Ab Leo. Steroid esters preparation. 4,537,722, Cl. 260-397.400.
Standard Car Truck Company: *See*—
Bullock, Robert L., 4,537,138, Cl. 105-168.000.
Standard Microsystems Corporation: *See*—
Lish, Charles A., 4,538,113, Cl. 330-126.000.
Standard Oil Company (Indiana): *See*—
Kilner, Peter H.; Egan, Joseph P., Jr.; Ceisel, Stephen G.; and Schammel, Wayne P., 4,537,978, Cl. 549-245.000.
Puri, Rajen, 4,537,252, Cl. 166-245.000.
Puskas, Imre; and Schmitt, Marshall, 4,537,985, Cl. 560-96.000.
Standard Oil Company (Ohio), The: *See*—
Tenhover, Michael A.; Henderson, Richard S.; and Grasselli, Robert K., 4,537,624, Cl. 75-0.50B.
Tenhover, Michael A.; Henderson, Richard S.; and Fox, Joseph R., 4,537,625, Cl. 75-0.50A.
Standard-Thomson Corporation: *See*—
Duprez, Wayne R., 4,537,346, Cl. 236-34.500.
Staropoli, Paul R.: *See*—
Rice, Thomas E.; and Staropoli, Paul R., 4,537,452, Cl. 312-314.000.
Starzewski, Karl-Heinz A. O.; and Witte, Josef, to Bayer Aktiengesellschaft. Production of organic nickel compounds. 4,537,982, Cl. 556-22.000.
State of Israel, Ministry of Defence, Military Industries, The: *See*—
Engel, Isaac, 4,536,966, Cl. 33-257.000.
Stauffer Chemical Company: *See*—
Pallos, Ferenc M., 4,537,620, Cl. 71-94.000.
Stednitz, Denis P., to Stednitz, Denis P. Cannulated fixation screw. 4,537,185, Cl. 128-92.00B.
Steere, Robert E., Jr.; and Lewandowski, Thomas, to Silicon Technology. Balanced rotary saw assembly and a method of balancing the same. 4,537,177, Cl. 125-13.00R.
Steetle, David R., to Digicon, Inc. Marine seismic streamer cable for providing selectable detector array connections. 4,538,251, Cl. 367-154.000.
Steffen, Jim M.: *See*—
Christiansen, David W.; Steffen, Jim M.; and Brown, William F., 4,537,741, Cl. 376-261.000.
Stendel, Joachim: *See*—
Rottgen, Karl; Stendel, Joachim; and Diskowski, Herbert, 4,537,756, Cl. 423-323.000.
Stephens, Charles E.: *See*—
Hunter, George L. K.; Dennison, Daniel B.; and Stephens, Charles E., 4,537,637, Cl. 127-60.000.
Stern, Richard A.: *See*—
Mariani, Elio A.; Stern, Richard A.; and Babbitt, Richard W., 4,538,123, Cl. 333-208.000.
Stevens, Keith D.; Harrison, John; and Kaye, Stanley B., to Cableform Limited. High power semiconductor heat sink assembly. 4,538,171, Cl. 357-81.000.
Stewart, Daniel R.: *See*—
Francel, Josef; Horn, Uriah; and Stewart, Daniel R., 4,537,862, Cl. 501-14.000.
Stewart Stamping Corporation: *See*—
Brennan, Robert J.; Meighen, Terrence; and Phillipson, Walter M., 4,537,459, Cl. 339-143.00R.
Stewart, William H. Antenna mount with rotary positionable feature. 4,538,155, Cl. 343-715.000.
Stiga AB: *See*—
Johansson, Soren; Andersson, Roger; and Jonsson, Lennart, 4,537,581, Cl. 474-123.000.
Stiles, Jack L. Air conditioning system. 4,537,035, Cl. 62-89.000.
Stoka, Roberto, to ITT Industries, Inc. Spot-type disc brake for automotive vehicles. 4,537,288, Cl. 188-71.800.
Stoll, Kurt; and Hihn, Gerhard. Braking device for a fluid power actuator. 4,537,113, Cl. 92-24.000.
Stoltefuss, Jurgen: *See*—
Heiker, Fred R.; Stoltefuss, Jurgen; Franckowiak, Gerhard; Schramm, Matthias; Thomas, Gunter; and Gross, Rainer, 4,537,881, Cl. 514-25.000.
Stolz, Albert, to Daimler-Benz Aktiengesellschaft. Motor vehicle with an internal-combustion engine and with means for heating a payload space. 4,537,349, Cl. 237-12.30C.
Storage Technology Corporation: *See*—
Fitzpatrick, William B., 4,538,189, Cl. 360-40.000.
Storandt, Ralf; and Mettenleiter, Karl, to Geze GmbH. Door holder-closer having a control signal operated hold-open function and a mechanical override facility. 4,536,916, Cl. 16-48.500.
Stoudt, Michael D., to Eastman Kodak Company. Apparatus and method for electrophotographically producing copy having continuous-tone and other content. 4,537,490, Cl. 355-3.00R.
Stout, Larry E. Method of construction of skirt for fishing lures. 4,536,986, Cl. 43-42.270.

Strand, David A., to Energy Conversion Devices, Inc. Apparatus for making a stamping master for video disk replication. 4,537,670, Cl. 204-224.00R.

Strange, Carl P.; Martin, Harold B., Jr.; and Tsang, Albert C., to Dow Chemical Company, The. Process for preparing cellulose ethers. 4,537,958, Cl. 536-85.000.

Stratoflex, Inc.: *See—*
Cooke, Horise M., 4,537,427, Cl. 285-305.000.

Stravitz, David M.; and Johnson, Gary D., to Johnson, Gary D. Blow dart game including hollow tube and dart with target impacting member and shock-absorbing portion. 4,537,176, Cl. 124-62.000.

Streitenberger, Walter: *See—*
Achinger, Michael; Jaeger, Erhard; Lipp, Reinhold; and Streitenberger, Walter, 4,537,238, Cl. 164-169.000.

Strike, Donald P.: *See—*
Scotese, Anthony C.; Morris, Robert L.; Santilli, Arthur A.; and Strike, Donald P., 4,537,968, Cl. 546-209.000.

Strong, Les O.: *See—*
Hanson, Oliver D.; Nicolai, Donald R.; and Strong, Les O., 4,537,194, Cl. 128-399.000.

Stubbs, John L., Jr.: *See—*
Cawlfield, David W.; Moore, William M.; and Stubbs, John L., Jr., 4,537,937, Cl. 525-417.000.

Studniarz, Stanley A.: *See—*
Dakin, Thomas W.; Studniarz, Stanley A.; and Chenoweth, Terrence E., 4,537,803, Cl. 427-385.500.

Stulen, Richard H.: *See—*
Haney, Steven J.; Stulen, Richard H.; and Toly, Norman F., 4,538,068, Cl. 250-443.100.

Stuntz, Gordon F.: *See—*
Bearden, Roby; and Stuntz, Gordon F., 4,537,676, Cl. 208-251.00R.

Subscan Systems Ltd.: *See—*
Douglas, Brian, 4,537,136, Cl. 104-138.00G.

Sucrow, Wolfgang; Schatull, Wolfgang; and Fuss, Peter, to Merck Patent Gesellschaft mit beschrankter Haftung. Liquid crystalline piperidine derivatives. 4,537,698, Cl. 252-299.610.

Sudo, Tadashi: *See—*
Shimizu, Masaki; Sudo, Tadashi; and Nomura, Takeo, 4,537,774, Cl. 424-195.100.

Sugie, Akihiko: *See—*
Ono, Keiichi; Sugie, Akihiko; Muraoka, Masami; and Yamamoto, Michihiro, 4,537,989, Cl. 562-501.000.

Sugie, Mamoru: *See—*
Toyooka, Takashi; Hirokazu, Aoki; Sugie, Mamoru; and Sugita, Yutaka, 4,538,242, Cl. 365-8.000.

Sugihara, Hiroshi: *See—*
Kohmoto, Osamu; Takasugi, Yasufumi; Sugihara, Hiroshi; and Nishimatsu, Masaharu, 4,537,832, Cl. 428-216.000.

Sugimoto, Kaname, to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo. Process for the production of human urokinase. 4,537,852, Cl. 435-215.000.

Sugimoto, Yutaka: *See—*
Fukushima, Akira; and Sugimoto, Yutaka, 4,537,268, Cl. 180-9.100.

Sugisawa, Ko; Matsumura, Yasushi; Taga, Kazumitsu; Sengoku, Kouji; and Nagatome, Yoshiaki, to House Food Industrial Company Ltd. Process for preparing retort tofu. 4,537,789, Cl. 426-634.000.

Sugita, Yutaka: *See—*
Toyooka, Takashi; Hirokazu, Aoki; Sugie, Mamoru; and Sugita, Yutaka, 4,538,242, Cl. 365-8.000.

Sugo, Yasuhisa; and Takeshima, Tohru, to Fujitsu Limited. Semiconductor memory device. 4,538,244, Cl. 365-155.000.

Suk, Suh Kyung: *See—*
Hong, Won P., 4,537,633, Cl. 106-96.000.

Sullivan, Michael T., to Exanno Products Limited. Duct joining system. 4,537,430, Cl. 285-364.000.

Sulzer Brothers Limited: *See—*
Breisinger, Otto; and Burgbacher, Herbert, 4,537,284, Cl. 184-7.400.
Rees, Karl, 4,537,156, Cl. 122-6.00A.

Sumitani, Katsuyoshi, to Sumitomo Gomu Kogyo Kabushiki Kaisha. Rubber tube for dredging work. 4,537,223, Cl. 138-139.000.

Sumitani, Katsuyoshi; and Takehara, Yasuo, to Sumitomo Gomu Kogyo Kabushiki Kaisha. Rubber tube for dredging work. 4,537,224, Cl. 138-139.000.

Sumitomo Chemical Company, Limited: *See—*
Ono, Keiichi; Sugie, Akihiko; Muraoka, Masami; and Yamamoto, Michihiro, 4,537,989, Cl. 562-501.000.
Takahashi, Takeo; Shimago, Kozo; and Maeshima, Kaoru, 4,537,973, Cl. 548-303.000.
Takao, Hiroyoshi; Yamamoto, Keisaku; Imai, Akio; Yoshida, Nobuyuki; Furukawa, Hiroshi; Saito, Yuichi; and Okumura, Akio, 4,537,936, Cl. 525-236.000.

Sumitomo Electric Industries, Ltd.: *See—*
Kawasaki, Akihisa; Tada, Kohji; Kotani, Toshihiro; and Miyazawa, Shintaro, 4,537,652, Cl. 156-617.0SP.
Saito, Shigeo; and Nagata, Masayuki, 4,537,642, Cl. 148-11.50Q.
Yamamoto, Susumu; and Sato, Kazuyoshi, 4,537,808, Cl. 428-36.000.

Sumitomo Gomu Kogyo Kabushiki Kaisha: *See—*
Sumitani, Katsuyoshi, 4,537,223, Cl. 138-139.000.
Sumitani, Katsuyoshi; and Takehara, Yasuo, 4,537,224, Cl. 138-139.000.

Sumitomo Heavy Industries, Ltd.: *See—*
Kanamori, Toshio, 4,537,241, Cl. 164-442.000.

Sumitomo Rubber Industries, Limited: *See—*
Takao, Hiroyoshi; Yamamoto, Keisaku; Imai, Akio; Yoshida, Nobuyuki; Furukawa, Hiroshi; Saito, Yuichi; and Okumura, Akio, 4,537,936, Cl. 525-236.000.

Sumiya, Mitsuo: *See—*
Kamiya, Masashi; Sumiya, Mitsuo; and Yamaguchi, Ryoji, 4,538,081, Cl. 310-90.000.

Summers, Mark A.; Hagen, Wilhelm F.; and Boyd, Robert D., to United States of America, Energy. Scattering apodizer for laser beams. 4,537,475, Cl. 350-448.000.

Sun Chemical Corporation: *See—*
Floyd, William C., 4,537,634, Cl. 106-214.000.
Lupoli, Peter J., 4,537,049, Cl. 70-277.000.

Sun, Shan C.; and Garitty, James P., to Westinghouse Electric Corp. Protective relay apparatus and method for providing single-pole tripping. 4,538,196, Cl. 361-64.000.

Sunada, Imao, to Noburu Onuki. Detector for diagnosing dental caries. 4,537,573, Cl. 433-32.000.

Sunbeam Plastics Corp.: *See—*
Montgomery, Gary V., 4,537,318, Cl. 215-232.000.

Sundberg, Erik G. Thin tubular positive electrodes for lead-acid batteries and method of making same. 4,537,842, Cl. 429-140.000.

Sundstrand Corporation: *See—*
Anderson, Wayne R., 4,537,220, Cl. 137-625.640.
Pollman, Frederic W.; Reynolds, David W.; and Heiser, Richard, 4,537,364, Cl. 242-86.510.
Siegrist, Gary D.; and Blain, Edward S., 4,536,990, Cl. 49-501.000.

Surawy, Ryszard: *See—*
Jackson, Graham; and Surawy, Ryszard, 4,537,075, Cl. 73-634.000.

Suzuki, Akihiro; Souda, Keiichi; Kuno, Masao; and Ikuta, Hiroshi, to Nippondenso Co., Ltd. Magnetic card reader. 4,538,191, Cl. 360-88.000.

Suzuki, Hidetoshi: *See—*
Saito, Seiji; Ayata, Naoki; Suzuki, Hidetoshi; Ozawa, Kunitaka; and Koumura, Noboru, 4,538,182, Cl. 358-280.000.

Suzuki, Masahiko: *See—*
Kuroyanagi, Masatoshi; and Suzuki, Masahiko, 4,537,171, Cl. 123-449.000.

Suzuki, Motomu: *See—*
Toraichi, Kazuo; Otsu, Nobuyuki; and Suzuki, Motomu, 4,538,227, Cl. 364-414.000.

Suzuki, Norio: *See—*
Ooshiro, Takehiko; Iwasaki, Masayoshi; Sahara, Kousuke; Suzuki, Norio; Utsumi, Hitoshi; Miyake, Kazuo; and Aburatani, Kenji, 4,537,073, Cl. 73-602.000.

Suzuki, Ryoichi; and Tokuda, Ryuji, to Canon Kabushiki Kaisha. Automatic focusing device. 4,537,489, Cl. 354-403.000.

Suzuki, Sobei: *See—*
Nishizawa, Junichi; Suzuki, Sobei; and Tamamushi, Takashige, 4,536,946, Cl. 29-571.000.

Suzuki, Toshiro: *See—*
Kunimi, Nobuo; Shimizu, Koichi; and Suzuki, Toshiro, 4,538,114, Cl. 330-253.000.

Suzuki, Yoshio: *See—*
Okada, Hisafumi; Suzuki, Yoshio; and Takenaka, Shigeo, 4,537,322, Cl. 220-2.10A.

Svensson, Claes G. S.: *See—*
Henriksson, Sven-Erik D.; Ahrel, Bo A.; Svensson, Claes G. S.; and Franzen, Torsten A. H., 4,537,655, Cl. 162-23.000.

Swenson, Kirk A.; and Swenson, Robert E. Roll container. 4,537,366, Cl. 242-137.000.

Swenson, Robert E.: *See—*
Swenson, Kirk A.; and Swenson, Robert E., 4,537,366, Cl. 242-137.000.

Swerdloff, Michael D.: *See—*
Van Der Puy, Michael; Kolc, Jaroslav F.; Anello, Louis G.; Hendrickson, Larry L.; Rogic, Milorad M.; and Swerdloff, Michael D., 4,537,614, Cl. 71-28.000.

Swihart, Terence J.: *See—*
Blizzard, John D.; and Swihart, Terence J., 4,537,829, Cl. 428-429.000.

Swiss Aluminium Ltd.: *See—*
Zollinger, Max; and Jemec, Raoul, 4,537,671, Cl. 204-243.00R.

Syed, Asif A., to General Electric Company. Acoustic impedance measurement. 4,537,630, Cl. 73-589.000.

SYNTHELABO: *See—*
Caillot, Luc; and Chopin, Claude, 4,537,190, Cl. 128-204.220.

Systron Donner Corp.: *See—*
Flanner, Philip D.; Morris, Harold D.; and Newell, Gerald R., 4,538,203, Cl. 361-159.000.

Szabo, Laszlo; and Schunemann, Klaus, to International Standard Electric Corporation. Diode oscillator with independently variable frequency and power. 4,538,122, Cl. 331-96.000.

Szilagyi, Geza: *See—*
Horvath, Istvan; Lang, Tibor; Pongo, Laszlo ; Reiter, Jozsef; Somorai, Tamas; Szilagyi, Geza; and Toldy, Lajos, 4,537,899, Cl. 514-384.000.

Szu, Harold H. Synergistic quasi-free electron laser. 4,538,275, Cl. 372-4.000.

T. T. Boughton & Sons, Ltd.: *See—*
Boughton, Thomas T., 4,537,540, Cl. 410-82.000.

Tabuchi, Takahisa: *See—*
Asari, Akira; Tsuzuki, Hidehiro; Inoue, Yoichi; and Tabuchi, Takahisa, 4,537,569, Cl. 425-405.00H.

Tada, Atuki: *See—*
Ishibashi, Masaya; and Tada, Atuki, 4,538,253, Cl. 369-34.000.

Tada, Kohji: *See*—
Kawasaki, Akihisa; Tada, Kohji; Kotani, Toshihiro; and Miyazawa, Shintaro, 4,537,652, Cl. 156-617.0SP.

Taddei, Alessandro: *See*—
Mancini, Paolo; Taddei, Alessandro; Macerata, Alberto; and Marchesi, Carlo, 4,537,202, Cl. 128-712.000.

Taga, Kazumitsu: *See*—
Sugisawa, Ko; Matsumura, Yasushi; Taga, Kazumitsu; Sengoku, Kouji; and Nagatome, Yoshiaki, 4,537,789, Cl. 426-634.000.

Taga, Tokio, to Nippon Telegraph & Telephone Public Corp. Directivity diversity communication system with microstrip antenna. 4,538,153, Cl. 343-700.0MS.

Taguchi, Masahiro: *See*—
Tsuge, Noboru; Taguchi, Masahiro; Kato, Masanori; and Kuwakado, Satosi, 4,537,169, Cl. 123-325.000.

Taisei Corporation: *See*—
Yamaguchi, Tadashi; Ono, Takayuki; Hirata, Michitoshi; and Yokoyama, Toshihiko, 4,537,645, Cl. !49-3.000.

Tajana, Franco: *See*—
Ballarati, Vito; and Tajana, Franco, 4,537,227, Cl. 139-420.00R.

Tajima, Hiroto; Kawakami, Hironori; Mashino, Zenichi; Hayami, Seinoshin; and Ohzeki, Osamu, to Chiyoda Chem. Engineering & Constr. Co.; and Nikka Chemical Industry Co., Ltd. Method for the preparation of pitch-in-water slurry. 4,537,600, Cl. 44-51.000.

Takada, Shun; Onodera, Kaoru; and Kadowaki, Takashi, to Konishiroku Photo Industry Co., Ltd. Silver halide photographic light-sensitive material. 4,537,857, Cl. 430-549.000.

Takagi, Masashi: *See*—
Nishi, Yasuyuki; Sakurai, Masao; and Takagi, Masashi, 4,537,042, Cl. 62-208.000.

Takagi, Masayuki; Mugiya, Hiroshi; and Komaju, Shigeru, to Fujitsu Limited. Power supply circuit. 4,538,102, Cl. 323-349.000.

Takagi, Toshijiro; and Watanabe, Eiji, to JEOL Ltd. Scanning electron microscope with an optical microscope. 4,537,477, Cl. 350-507.000.

Takahashi, Akio: *See*—
Kambara, Shu; Arakawa, Tatsumi; and Takahashi, Akio, 4,537,950, Cl. 528-380.000.

Takahashi, Jiro; Sawada, Kiyoshi; Kinoshita, Akira; Komamura, Tawara; Goto, Satoshi; and Sasaki, Osamu, to Konishiroku Photo Industry Co., Ltd. Disazo photoreceptors for electrophotography. 4,537,847, Cl. 430-58.000.

Takahashi, Katsutoshi: *See*—
Umezawa, Hamao; Fujii, Akio; Muraoka, Yasuhiko; Nakatani, Tokuji; Fukuoka, Takeyo; and Takahashi, Katsutoshi, 4,537,880, Cl. 514-19.000.

Takahashi, Takehiko: *See*—
Nakamura, Hiromi; Takahashi, Takehiko; Narazaki, Norio; Yamamoto, Kazuo; and Sayama, Norio, 4,537,023, Cl. 60-39.050.

Takahashi, Takeo; Shimago, Kozo; and Maeshima, Kaoru, to Sumitomo Chemical Company, Limited. Process for preparing biotin. 4,537,973, Cl. 548-303.000.

Takahasi, Kenichiro, to Hitachi, Ltd. Output control device for light detectors for photometers. 4,537,510, Cl. 356-435.000.

Takanashi, Nobuyasu, to Terumo Kabushiki Kaisha. Package for storage of medical container. 4,537,305, Cl. 206-438.000.

Takao, Hiroyoshi; Yamamoto, Keisaku; Imai, Akio; Yoshida, Nobuyuki; Furukawa, Hiroshi; Saito, Yuichi; and Okumura, Akio, to Sumitomo Chemical Company, Limited; and Sumitomo Rubber Industries, Limited. Diene rubber composition, method of preparing the same and tire employing said composition. 4,537,936, Cl. 525-236.000.

Takasugi, Yasufumi: *See*—
Kohmoto, Osamu; Takasugi, Yasufumi; Sugihara, Hiroshi; and Nishimatsu, Masaharu, 4,537,832, Cl. 428-216.000.

Takata, Masahiro: *See*—
Sato, Takahisa; Takata, Masahiro; Ueshima, Michio; and Nagai, Isao, 4,537,874, Cl. 502-311.000.

Takayama, Yoshihisa; Gotoh, Kunihiko; Ito, Akihiko; Yamamura, Takeshi; and Fujita, Kazuyoshi, to Fujitsu Limited. Method for fabricating an integrated circuit with multi-layer wiring having opening for fuse. 4,536,949, Cl. 29-578.000.

Takeda, Hideo, to Fuji Photo Film Co., Ltd. Coating method and apparatus. 4,537,801, Cl. 427-356.000.

Takehara, Yasuo: *See*—
Sumitani, Katsuyoshi; and Takehara, Yasuo, 4,537,224, Cl. 138-139.000.

Takenaka, Shigeo: *See*—
Okada, Hisafumi; Suzuki, Yoshio; and Takenaka, Shigeo, 4,537,322, Cl. 220-2.10A.

Takeshige, Kosuke: *See*—
Oogai, Michiharu; Seita, Toru; Takeshige, Kosuke; and Shuyama, Hideo, 4,537,910, Cl. 521-27.000.

Takeshima, Tohru: *See*—
Sugo, Yasuhisa; and Takeshima, Tohru, 4,538,244, Cl. 365-155.000.

Takeuchi, Haruo, to Olympus Optical Co., Ltd. Connecting mechanism of light source device for endoscope. 4,537,453, Cl. 339-33.000.

Takeya, Yasushi: *See*—
Yamanaka, Takashi; Takeya, Yasushi: Yorita, Mitsumasa; Horiuchi, Toshiaki; Inagaki, Kouichi; Naya, Eizo; Demizu, Michinosuke; and Okumura, Mitsuhiro, 4,537,743, Cl. 419-38.000.

Takigawa, Nobuhiro; Watanabe, Hideo; Kawasaki, Kanzirou; Kubo, Keishi; Hakiri, Minoru; and Kawamura, Eiichi, to Ricoh Co., Ltd. Heat-sensitive transfer medium. 4,538,164, Cl. 346-209.000.

Talcott, Thomas D., to Innovative Surgical Products, Inc. Correction of defects in the eye and compositions therefor. 4,537,943, Cl. 528-15.000.

Tam, Wilson, to Du Pont de Nemours, E. I., and Company. Monoorganylation of dihaloaromatics. 4,538,003, Cl. 568-656.000.

Tamamushi, Takashige: *See*—
Nishizawa, Junichi; Suzuki, Sobei; and Tamamushi, Takashige, 4,536,946, Cl. 29-571.000.

Tamura, Kaoru, to Fuji Photo Film Co., Ltd. Daylight film loading method and apparatus, film and film package used for same. 4,537,307, Cl. 206-455.000.

Tamura, Kaoru; and Ogo, Yoshimasa, to Tokyo Shibaura Denki Kabushiki Kaisha. X-Ray film-holding device with convex cushion members. 4,538,294, Cl. 378-187.000.

Tamura, Koichi, to Tokico Ltd. Friction pad assembly for a disc brake. 4,537,292, Cl. 188-73.390.

Tamura, Shingo: *See*—
Hattori, Osamu; and Tamura, Shingo, 4,538,254, Cl. 369-43.000.

Tanaka, Masaho; Shishido, Tomio; Fukuhara, Tetsukazu; Yao, Yugo; Kobayashi, Kunihilo; and Inoue, Yoshio, to Neturen Co., Ltd.; Asahi Kasei Kogyo Kabushiki Kaisha; and Asahi Kasei Kogyo Kabushiki Hiraoka & Co. Method and apparatus for forming reinforcing cage for prestressed concrete pile. 4,538,042, Cl. 219-58.000.

Tanaka, Minoru: *See*—
Terahara, Akira; and Tanaka, Minoru, 4,537,859, Cl. 435-146.000.

Tanaka, Toshinori, to Mitsubishi Denki Kabushiki Kaisha. Magneto-type D-C electric motor. 4,538,085, Cl. 310-239.000.

Tang, Chung L.: *See*—
Donaldson, William R.; and Tang, Chung L., 4,537,990, Cl. 564-63.000.

Tanida, Masashi: *See*—
Kitayama, Minoru; Nakamura, Motoharu; Hirose, Kikuji; and Tanida, Masashi, 4,537,792, Cl. 427-13.000.

Tanigawa, Kou; Masuda, Jiro; Nakamura, Kazumasa; and Hayashi, Kazuhiko, to Fujitsu Ten Limited; and Toyota Jidosha Kabushiki Kaisha. Automotive vehicle speed control device based on a preselected speed. 4,537,272, Cl. 180-176.000.

Taniguchi, Nobuyuki; Ishikawa, Norio; and Egawa, Takeshi, to Minolta Camera Kabushiki Kaisha. Automatic focus control system with backlash correcting arrangement. 4,537,487, Cl. 354-400.000.

Tanner, Howard M. C., to HGM, Inc. Laser endocoagulator apparatus. 4,537,193, Cl. 128-303.100.

Targowski, Roger: *See*—
Hill, Harold I.; Norem, Stanley D.; and Targowski, Roger, 4,537,572, Cl. 432-55.000.

Tarjan, Peter P., to Cordis Corporation. Carbon coating of grafts or catheters. 4,537,791, Cl. 427-2.000.

Tavs, Peter: *See*—
Goetz, Norbert; Laas, Harald; Tavs, Peter; Hupfer, Leopold; and Baer, Karl, 4,538,009, Cl. 568-799.000.

Taylor, Andrew W.; and Cook, Richard T., to Beecham Group p.l.c. β-lactam antibacterial agents and compositions containing them. 4,537,886, Cl. 514-193.000.

Taylor, Jay E.: *See*—
Sequeira, Hermann B.; and Taylor, Jay E., 4,538,276, Cl. 372-26.000.

Taylor, Kevin D.; and Nichols, Galen N., to TNF Enterprises. Face and nose wiper holding device for skiers. 4,536,889, Cl. 2-160.000.

Taylor, William H., to Kollmorgen Technologies. Optical scanner. 4,538,181, Cl. 358-208.000.

Tazuma, James J.: *See*—
Gloth, Richard E.; Tazuma, James J.; and Smith, Robert A., 4,537,952, Cl. 528-392.000.

TDK Corporation: *See*—
Kohmoto, Osamu; Takasugi, Yasufumi; Sugihara, Hiroshi; and Nishimatsu, Masaharu, 4,537,832, Cl. 428-216.000.

Teachout, Paul H. Foldable dolly. 4,537,421, Cl. 280-654.000.

Tebel Machinefabrieken B.V.: *See*—
van der Velde, Ype Y.; and Zantinge, Jan, 4,537,787, Cl. 426-478.000.

Technicare Corporation: *See*—
Dietz, Dennis R., 4,537,074, Cl. 73-625.000.

Technion Research and Development Foundation, Inc.: *See*—
Lavie, Ram, 4,537,760, Cl. 423-359.000.

TELDEC Telefunken-Decca Schallplatten GmbH: *See*—
Redlich, Horst, 4,538,256, Cl. 369-88.000.

Telsonic AG Fur Elektronische Entwicklung Und Fabrikation: *See*—
Frei, Karl, 4,537,511, Cl. 366-127.000.

Tenhover, Michael A.; Henderson, Richard S.; and Grasselli, Robert K., to Standard Oil Company (Ohio), The. Amorphous metal alloy powders and synthesis of same by solid state decomposition reactions. 4,537,624, Cl. 75-0.50B.

Tenhover, Michael A.; Henderson, Richard S.; and Fox, Joseph R., to Standard Oil Company (Ohio), The. Amorphous metal alloy powders and synthesis of same by solid state chemical reduction reactions. 4,537,625, Cl. 75-0.50A.

Terada, Takami: *See*—
Maruyama, Katsuaki; Oishi, Yaichi; Noda, Norio; Terada, Takami; and Hyodo, Motoi, 4,537,444, Cl. 297-284.000.

Terahara, Akira; and Tanaka, Minoru, to Sankyo Company, Limited. Process for preparing 3-hydroxy-ML-236B derivatives known as M-4 and M-4'. 4,537,859, Cl. 435-146.000.

Teraishi, Katsuhiro, to Kabushiki Kaisha Suwa Seikosha. Synthesis of beryl crystals. 4,537,653, Cl. 156-620.000.

Teraura, Nobuyuki: *See*—
Sakai, Toshiyasu; Hara, Masahiro; and Teraura, Nobuyuki, 4,538,060, Cl. 235-472.000.

Terry, Lynn E.; and Schoeppel, Roger J. Power cycles based upon cyclical hydriding and dehydriding of a material. 4,537,031, Cl. 60-649.000.

Terui, Nobuhiko, to Nippon Kogaku K.K. Camera system. 4,537,488, Cl. 354-402.000.

Terumo Corporation: *See—*
Shimizu, Masaki; Sudo, Tadashi; and Nomura, Takeo, 4,537,774, Cl. 424-195.100.

Terumo Kabushiki Kaisha: *See—*
Murase, Masakazu, 4,537,518, Cl. 374-188.000.
Takanashi, Nobuyasu, 4,537,305, Cl. 206-438.000.

Tessier, Jean; Demoute, Jean-Pierre; and Cadiergue, Joseph, to Roussel Uclaf. 3-(1,2-Propadienyl)-cyclopropane-carboxylates. 4,537,897, Cl. 514-351.000.

Test Point I, Inc.: *See—*
Douglas, Bruce S.; and Westergart, Chester V., 4,538,104, Cl. 324-158.00F.

Tetenborg, Konrad; and Eschmann, Heinz, to Windmoller & Holscher. Bag-filling apparatus. 4,537,013, Cl. 53-570.000.

Te Velde, Ties S.; and Slob, Arie, to U.S. Philips Corporation. Method of manufacturing programmable semiconductor device. 4,536,948, Cl. 29-577.00C.

Texas Instruments Incorporated: *See—*
Hochschild, James R., 4,538,282, Cl. 375-9.000.
Magar, Surendar S., 4,538,239, Cl. 364-759.000.
Roberts, Charles G.; and Hall, Joseph E., 4,538,287, Cl. 377-60.000.
Spicer, Denis F., 4,538,127, Cl. 335-210.000.
Ty, Henry; and White, Alfred J., 4,537,365, Cl. 242-107.600.

Textilmaschinenfabrik Dr. Ernst Fehrer Aktiengesellschaft: *See—*
Feyerl, Gunther; Minichshofer, Klaus; and Pum, Hans G., 4,536,927, Cl. 28-110.000.
Fuchs, Helmut, 4,537,020, Cl. 57-263.000.

Tezuka, Hisao: *See—*
Kanno, Masayuki; Tezuka, Hisao; Izawa, Kouji; and Kamiyama, Tadanobu, 4,538,183, Cl. 358-280.000.

Th. Goldschmidt AG: *See—*
Fock, Jurgen; and Schedlitzki, Dietmar, 4,537,934, Cl. 525-123.000.
Gruning, Burghard; Holtschmidt, Ulrich; and Koerner, Gotz, 4,537,595, Cl. 8-115.600.

Tharp, Emery C. Reciprocating backhoe bucket. 4,537,556, Cl. 414-725.000.

Theilacker, Klaus, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Stripper for a roller cleaning device. 4,537,130, Cl. 101-425.000.

Theodor Hymmen KG., Firma: *See—*
Pankoke, Werner, 4,537,408, Cl. 277-34.000.

Thermo King Corporation: *See—*
Seshadri, Jayaram; and Neimy, Daniel T., 4,537,047, Cl. 62-510.000.

Theurer, Josef, to Franz Plasser Bahnbaumaschinen Industriegesellschaft m.b.H. Tamping unit. 4,537,135, Cl. 104-12.000.

Thiel, Rudolf; Weisbrod, Helmut; and Braehler, Hermann, to ITT Industries, Inc. Brake shoe assembly including brake shoe spring. 4,537,291, Cl. 188-73.380.

Thiemer, Heinz: *See—*
Donike, Wilhelm; Ulrich, Helmut; Thiemer, Heinz; and Pieper, Josefa, 4,538,013, Cl. 585-361.000.

Thissen, Christopher P., to Walker Process Corporation. Rotary biological contactor. 4,537,678, Cl. 210-150.000.

Thomas A. Schutz Co., Inc.: *See—*
Simon, Virgil S.; Adenau, Marvin L.; and Skalski, John S., 4,537,316, Cl. 211-133.000.

Thomas, Andre : *See—*
Zumbrunn, Jean-Pierre; Levielle, Jean; Thomas, Andre ; and Grangette. Francoise, 4,536,907, Cl. 8-149.100.

Thomas, Gilles R., to International Paper Company. Interlocking corner structure on tray for frozen fruits and vegetables. 4,537,344, Cl. 229-34.00R.

Thomas, Gunter: *See—*
Heiker, Fred R.; Stoltefuss, Jurgen; Franckowiak, Gerhard; Schramm, Matthias; Thomas, Gunter; and Gross, Rainer, 4,537,881, Cl. 514-25.000.

Thomas, John E.; Gretz, Ronald D.; and Tippins, George W., to Tippins Machinery Company, Inc. Method for thermomechanically rolling hot strip product to a controlled microstructure. 4,537,643, Cl. 148-12.00R.

Thomas Jourdan PLC: *See—*
Varndell, Sydney A.; Lawson, Douglas R.; and Fountain, Michael W., 4,536,906, Cl. 5-468.000.

Thomas, Rudy V., to Allied Corporation. Lock-up mechanism for a vehicle sensitive automotive seat belt retractor. 4,537,363, Cl. 242-107.40A.

Thompson, Paul D., to DEC International, Inc. Milking claw. 4,537,152, Cl. 119-14.540.

Thomson CSF: *See—*
Lorieux, Roland, 4,538,118, Cl. 330-286.000.
Pham Van Cang, Luc, 4,538,268, Cl. 371-20.000.

Thorsheim, Howard I.; and Roberts, Bruce B. Educational book with interactive elements. 4,537,576, Cl. 434-404.000.

Thrush Incorporated: *See—*
Roberts, Peter, 4,537,280, Cl. 181-243.000.

Thul, James L., to Press, Inc., The. Tear-off pad rail clip. 4,537,310, Cl. 206-526.000.

Thurne Engineering Co. Ltd.: *See—*
Hoyland. Trevor B., 4,537,005, Cl. 53-131.000.

TIBA AG Kochherdfabrik und Apparatebau: *See—*
Brunner, Ernst, 4,537,141, Cl. 110-300.000.

Tice, Victor M.: *See—*
Ronemus, DeHertburn N.; and Tice, Victor M., 4,538,040, Cl. 200-159.00A.

Tick, Paul A., to Corning Glass Works. Metal fluoride glasses in the CdF_2-PbF_2-AlF_3-(LiF) system. 4,537,864, Cl. 501-30.000.

Tieman, Charles H.: *See—*
Sanborn, James R.; and Tieman, Charles H., 4,537,780, Cl. 514-464.000.

Tildeblad, Bernhard. Optical aiming device. 4,536,965, Cl. 33-233.000.

Tippins, George W.: *See—*
Thomas, John E.; Gretz, Ronald D.; and Tippins, George W., 4,537,643, Cl. 148-12.00R.

Tippins Machinery Company, Inc.: *See—*
Thomas, John E.; Gretz, Ronald D.; and Tippins, George W., 4,537,643, Cl. 148-12.00R.

Titus, Robert D.; and Kornfeld, Edmund C., to Eli Lilly and Company. Octahydrothiazolo[4,5-g]quinolines and use as prolactin secretion inhibitors. 4,537,893, Cl. 514-293.000.

TNF Enterprises: *See—*
Taylor, Kevin D.; and Nichols, Galen N., 4,536,889, Cl. 2-160.000.

TNI Pharmaceuticals, Inc.: *See—*
Plotnikoff, Nicholas P., 4,537,878, Cl. 514-2.000.

Toda, Akitoshi: *See—*
Mimura, Yoshiyuki; Okada, Takao; and Toda, Akitoshi, 4,537,845, Cl. 430-58.000.
Mimura, Yoshiyuki; Okada, Takao; and Toda, Akitoshi, 4,537,846, Cl. 430-58.000.

Todd, David B., to Shell Oil Company. Submersible pump. 4,537,257, Cl. 166-369.000.

Tohoku Metal Industries, Ltd.: *See—*
Yamaguchi, Tadashi; Ono, Takayuki; Hirata, Michitoshi; and Yokoyama, Toshihiko, 4,537,645, Cl. 149-3.000.

Tokico Ltd.: *See—*
Tamura, Koichi, 4,537,292, Cl. 188-73.390.

Tokita, Kiyoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Cathode-ray tube. 4,537,321, Cl. 220-2.10A.

Tokuda, Ryuji: *See—*
Suzuki, Ryoichi; and Tokuda, Ryuji, 4,537,489, Cl. 354-403.000.

Tokura, Norihito: *See—*
Kanehara, Kenji; Kohama, Tokio; Kawai, Hisasi; and Tokura, Norihito, 4,537,172, Cl. 123-527.000.

Tokyo Electric Co., Ltd.: *See—*
Ochiai, Kuniaki; and Komakine, Shigeo, 4,537,520, Cl. 400-124.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Imanishi, Kazuo; Hashimoto, Masaru; and Mori, Makoto, 4,538,198, Cl. 361-86.000.
Inomata, Koichiro; and Murata, Shinichi, 4,537,517, Cl. 374-21.000.
Kakumu, Masakazu, 4,536,943, Cl. 29-571.000.
Kamiya, Masashi; Sumiya, Mitsuo; and Yamaguchi, Ryoji, 4,538,081, Cl. 310-90.000.
Kanno, Masayuki, Tezuka, Hisao; Izawa, Kouji; and Kamiyama, Tadanobu, 4,538,183, Cl. 358-280.000.
Koyama, Kiyomi, 4,538,232, Cl. 364-491.000.
Machida, Kaoru, 4,537,203, Cl. 128-734.000.
Mitani, Ryo; Moriya, Yoshiaki; and Kobayashi, Atsushi, 4,538,145, Cl. 340-805.000.
Miyamura, Masataka; Sakamoto, Masanori; and Nakajima, Yuko, 4,537,826, Cl. 428-328.000.
Miyoshi, Motosuke; and Sano, Tetsuya, 4,538,065, Cl. 250-310.000.
Mori, Leo; Tominaga, Mamoru; and Aoba, Takashi, 4,538,216, Cl. 362-311.000.
Muranaka, Yuuichi, 4,537,199, Cl. 128-660.000.
Nakamura, Yasushi, 4,538,290, Cl. 378-44.000.
Okada, Hisafumi; Suzuki, Yoshio; and Takenaka, Shigeo, 4,537,322, Cl. 220-2.10A.
Tamura, Kaoru; and Ogo, Yoshimasa, 4,538,294, Cl. 378-187.000.
Tokita, Kiyoshi, 4,537,321, Cl. 220-2.10A.
Tsunoda, Sachio; and Sato, Shinsaku, 4,537,558, Cl. 415-1.000.
Yamagami, Nobuhiko, 4,538,144, Cl. 340-747.000.

Toland, Richard H.: *See—*
Kulkarni, Satish V.; Christensen, Richard M.; and Toland, Richard H., 4,537,091, Cl. 74-572.000.

Tolbert, William R.; Feder, Joseph; and Lewis, Charles, Jr., to Monsanto Company. Static cell culture maintenance system. 4,537,860, Cl. 435-240.000.

Tolco Corporation: *See—*
Spengler, William E.; and Ramsey, William C., 4,537,334, Cl. 222-401.000.

Toldy, Lajos: *See—*
Horvath, Istvan; Lang, Tibor; Pongo, Laszlo ; Reiter, Jozsef; Somorai, Tamas; Szilagyi, Geza; and Toldy, Lajos, 4,537,899, Cl. 514-384.000.

Toly, Norman F.: *See—*
Haney, Steven J.; Stulen, Richard H.; and Toly, Norman F., 4,538,068, Cl. 250-443.100.

Tominaga, Jiro; Yada, Hiroshi; and Honda, Mitsuo, to Nippon Steel Corporation. High-tension high-toughness steel having excellent resistance to delayed fracture and method for producing the same. 4,537,644, Cl. 148-36.000.

Tominaga, Mamoru: *See—*
Mori, Leo; Tominaga, Mamoru; and Aoba, Takashi, 4,538,216, Cl. 362-311.000.

Tomita, Yoshifumi: *See—*
Nonogaki, Saburo; Hayashi, Nobuaki; and Tomita, Yoshifumi, 4,537,851, Cl. 430-144.000.

Tooka, Takuzo, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Apparatus for sliver can controlling in a spinning mill. 4,537,018, Cl. 57-90.000.

Toraichi, Kazuo; Otsu, Nobuyuki; and Suzuki, Motomu, to Agency of Industrial Science and Technology; and Ministry of International Trade and Industry. Medical image processor. 4,538,227, Cl. 364-414.000.

Toshiba Silicone Co., Ltd.: *See*—
Imai, Takafumi; and Kobayashi, Fumihiko, 4,537,944, Cl. 528-18.000.

Tosi, Riccardo, to Merisinter S.p.A. Twin element, cylindrically disassemblably hinged tool. 4,536,958, Cl. 30-120.300.

Toth nee Pecsi, Erzsebet: *See*—
Desk, Gyula; Zara nee Kaczian, Erzsebet; Gyorgy, Lajos; Fekete, Marton; Doda, Margit; Seregi, Andras; Kanyicska, Bela; Toth nee Pecsi, Erzsebet; Horvath nee Gaal, Maria; Manyai, Sandor; Gorgenyi, Frigyes; and Vaszovics nee Reichmann, Gyorgyi, 4,537,895, Cl. 514-307.000.

Toulhoat, Herve ; Plumail, Jean-Claude; Mercier, Marc; and Jacquin, Yves, to Societe Francaise des Produits pour Catalyse Pro-Catalyse. Crushed catalysts containing alumina, silica or silica-alumina, and process for their manufacture. 4,537,875, Cl. 502-314.000.

Tourneur, Auburt, deceased (by Tourneur, Monique, legal representative), to Appareillages et Materiels de Servitudes. Process and apparatus for recovering energy, in the form of electric energy, from a motor test bench. 4,538,097, Cl. 318-490.000.

Tourneur, Monique, legal representative: *See*—
Tourneur, Auburt, deceased, 4,538,097, Cl. 318-490.000.

Towae, Friedrich: *See*—
Merger, Franz; Nestler, Gerhard; and Towae, Friedrich, 4,537,960, Cl. 544-86.000.

Towle, Theodore: *See*—
Petersen, Oscar J.; Barton, Ross J.; Dalke, Jack E.; Sheffield, Gerald W.; and Towle, Theodore, 4,537,384, Cl. 251-83.000.

Townsend, Wesley P.: *See*—
Dorey, John K., II; Schmidt, Steven L.; and Townsend, Wesley P., 4,537,799, Cl. 427-259.000.

Toyo Boseki Kabushiki Kaisha: *See*—
Nanri, Shosuke; and Tsuchida, Kazuyoshi, 4,537,822, Cl. 428-212.000.

Toyo Engineering Corporation: *See*—
Ando, Toshihiko; Ito, Norifumi; Matsubara, Tetsuyuki; Ichikawa, Kozo; Fukawa, Susumu; and Maeda, Tetsuo, 4,537,954, Cl. 528-481.000.

Toyo Soda Manufacturing Co., Ltd.: *See*—
Oogai, Michiharu; Seita, Toru; Takeshige, Kosuke; and Shuyama, Hideo, 4,537,910, Cl. 521-27.000.

Toyo Tire & Rubber Company Limited: *See*—
Otani, Kozo; and Yamada, Yoshio, 4,537,945, Cl. 528-68.000.

Toyoda Gosei Co., Ltd.: *See*—
Itoh, Toshiyasu; and Mori, Takaaki, 4,537,814, Cl. 428-217.000.

Toyooka, Takashi; Hirokazu, Aoki; Sugie, Mamoru; and Sugita, Yutaka. Signal processing circuit for magnetic bubble memory devices. 4,538,242, Cl. 365-8.000.

Toyota Jidosha Kabushiki Kaisha: *See*—
Arai, Shigeharu, 4,537,381, Cl. 248-559.000.
Morisawa, Kunio, 4,537,092, Cl. 74-695.000.
Tanigawa, Kou; Masuda, Jiro; Nakamura, Kazumasa; and Hayashi, Kazuhiko, 4,537,272, Cl. 180-176.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Maruyama, Katsuaki; Oishi, Yaichi; Noda, Norio; Terada, Takami; and Hyodo, Motoi, 4,537,444, Cl. 297-284.000.
Morisawa, Kunio, 4,537,095, Cl. 74-868.000.
Nagasaka, Yasumasa, 4,536,937, Cl. 29-460.000.

Traina, Anthony: *See*—
Bertellotti, Ansano; and Traina, Anthony, 4,538,211, Cl. 361-415.000.

Transamerica Delaval Inc.: *See*—
Milish, William P., 4,537,070, Cl. 73-313.000.
Milish, William P., 4,537,219, Cl. 137-614.190.

Treadwell, Mark C.: *See*—
Harwood, Jon W.; Clegg, Michael W.; and Treadwell, Mark C., 4,537,027, Cl. 60-323.000.

Trillium Telephone Systems Inc.: *See*—
Benning, Gordon D.; Pascas, Brian J.; Blackhall, Robert K.; Wilker, Paul S.; and Neathway, Graham A., 4,538,031, Cl. 179-81.00B.

Trivedi, Jitendra K.: *See*—
Morris, Arnold M.; and Trivedi, Jitendra K., 4,537,286, Cl. 187-1.00A.

Troxell, John N., Jr., to Cameron Iron Works, Inc. Shearing type blowout preventer. 4,537,250, Cl. 166-55.000.

TRW Inc.: *See*—
Berenz, John J.; and Nakano, Kenichi, 4,537,654, Cl. 156-644.000.

Tsang, Albert C.: *See*—
Strange, Carl P.; Martin, Harold B., Jr.; and Tsang, Albert C., 4,537,958, Cl. 536-85.000.

Tsang, Peter H.; Coyle, Joseph P.; Liu, Tung; and VanderPoorte, John G., to Allied Corporation. Method of manufacturing a friction article. 4,537,823, Cl. 428-308.400.

Tsaur, Shyh-Chang: *See*—
Kuo, Chang-Kiang; and Tsaur, Shyh-Chang, 4,536,941, Cl. 29-571.000.

Tsubonuma, Yoshio; and Kawai, Tohru, to Shimizu Construction Co., Ltd., The. Process and apparatus of constructing a water tight underground pile wall. 4,537,536, Cl. 405-267.000.

Tsuchida, Kazuyoshi: *See*—
Nanri, Shosuke; and Tsuchida, Kazuyoshi, 4,537,822, Cl. 428-212.000.

Tsuchida, Yutaka; and Fukai, Toshiyuki, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Apparatus for continuous casting. 4,537,240, Cl. 164-430.000.

Tsuchiya, Hiroyoshi: *See*—
Otsuka, Hirotaka; Nakazato, Katsuo; Sannomiya, Kunio; Kawakami, Hidehiko; Tsuchiya, Hiroyoshi; and Uchida, Hideo, 4,538,184, Cl. 358-283.000.

Tsuchiya, Shuji: *See*—
Hashiba, Isao; Nishikimi, Tadashi; and Tsuchiya, Shuji, 4,537,984, Cl. 560-061.000.

Tsuge, Noboru; Taguchi, Masahiro; Kato, Masanori; and Kuwakado, Satosi, to Nippon Soken, Inc. Fuel injection device of diesel engine. 4,537,169, Cl. 123-325.000.

Tsukada, Kiyotaka: *See*—
Enomoto, Ryo; and Tsukada, Kiyotaka, 4,537,735, Cl. 264-63.000.

Tsukui, Tsutomu; Shimizu, Toshio; Doi, Ryota; and Tsutsumi, Yasuyuki, to Hitachi, Ltd. Fuel cell using organic, high-molecular weight electrolyte. 4,537,840, Cl. 429-33.000.

Tsunoda, Sachio; and Sato, Shinsaku, to Tokyo Shibaura Denki Kabushiki Kaisha. Multi-stage hydraulic machine and control method for a multi-stage hydraulic machine. 4,537,558, Cl. 415-1.000.

Tsutomu, Kimura; Nakayama, Hideo; and Fuseda, Yuichi, to Fuji Photo Film Co., Ltd. Image processing for unsharp masking of image. 4,538,179, Cl. 358-166.000.

Tsutsumi, Yasuyuki: *See*—
Tsukui, Tsutomu; Shimizu, Toshio; Doi, Ryota; and Tsutsumi, Yasuyuki, 4,537,840, Cl. 429-33.000.

Tsuzuki, Hidehiro: *See*—
Asari, Akira; Tsuzuki, Hidehiro; Inoue, Yoichi; and Tabuchi, Takahisa, 4,537,569, Cl. 425-405.00H.

Tucker, Donald, to Raychem Corporation. Device to separate wires to be encapsulated in a connector. 4,538,020, Cl. 174-65.00R.

Tucker, Paul A.: *See*—
Rogers, Brian H.; and Tucker, Paul A., 4,537,607, Cl. 55-163.000.

Tuerenwerke Riexinger GmbH & Co. KG: *See*—
Riexinger sen., Gustav; and Nagel, Rudolf, 4,536,929, Cl. 29-33.00K.

Tungatt, Paul D.: *See*—
Tyler, Derek E.; Cheskis, Harvey P.; and Tungatt, Paul D., 4,537,627, Cl. 75-76.000.

Turner, Earl W., to Audiovox Corp. Vehicular security system. 4,538,135, Cl. 340-63.000.

Turner, Roger S. Optical projection viewing system. 4,537,483, Cl. 353-39.000.

Tuten, William J.; Crosby, Kennith D.; and Bergquist, Bertil R., to Creative Technology, Inc. DC to AC inverter and motor control system. 4,538,100, Cl. 318-808.000.

Ty, Henry; and White, Alfred J., to Texas Instruments Incorporated. Safety seat belt system and latch release mechanism used therein. 4,537,365, Cl. 242-107.600.

Tyler, Derek E.; Cheskis, Harvey P.; and Tungatt, Paul D., to Olin Corporation. Technique for removing impurities from a copper melt. 4,537,627, Cl. 75-76.000.

Tyler Refrigeration Corporation: *See*—
Ibrahim, Fayez F., 4,537,040, Cl. 62-186.000.

Uchida, Hideo: *See*—
Otsuka, Hirotaka; Nakazato, Katsuo; Sannomiya, Kunio; Kawakami, Hidehiko; Tsuchiya, Hiroyoshi; and Uchida, Hideo, 4,538,184, Cl. 358-283.000.

Uchida, Hiroyasu, to Fuji Xerox Co., Ltd. Protecting device in self-diagnosis. 4,538,267, Cl. 371-20.000.

Uchida, Toshio: *See*—
Ohba, Hisao; Uchida, Toshio; Ohashi, Azusa; and Kita, Nobuyuki, 4,537,496, Cl. 355-10.000.

Uchiyama, Tadamitsu, to Minolta Camera Kabushiki Kaisha. Ink jet recording apparatus. 4,538,160, Cl. 346-140.00R.

Ueda, Hiroshi; Saito, Mitsuru; and Kajita, Hideo, to Minolta Camera Kabushiki Kaisha. System and process for producing molded optical elements. 4,537,732, Cl. 264-1.100.

Uemura, Fumiko: *See*—
Omura, Ikuo; Yamauchi, Junichi; Nagase, Yoshinori; and Uemura, Fumiko, 4,537,940, Cl. 526-278.000.

Ueshima, Michio: *See*—
Sato, Takahisa; Takata, Masahiro; Ueshima, Michio; and Nagai, Isao, 4,537,874, Cl. 502-311.000.

Uffner, William E.; White, Robert N.; and Harrington, Edward R., to Owens-Corning Fiberglas Corporation. Blended pressure-sensitive asphaltic based adhesives. 4,537,921, Cl. 524-59.000.

Ugon, Michel; and Fouchard, Serge, to Cii Honeywell Bull (Societe Anonyme). Power supply system of a device designed to cooperate with a removable electronic medium such as a card and device equipped with such a system. 4,538,058, Cl. 235-380.000.

Uhde GmbH: *See*—
Buxel, Ludwig M.; and Mulhaus, Ludwig, 4,537,571, Cl. 432-27.000.

Ukigai, Toshiyuki: *See*—
Morita, Hiroshi; Kawada, Yasuyuki; Yamada, Junichi; and Ukigai, Toshiyuki, 4,537,253, Cl. 166-274.000.

Ulrich, Helmut: *See*—
Donike, Wilhelm; Ulrich, Helmut; Thiemer, Heinz; and Pieper, Iosefa, 4,538,013, Cl. 585-361.000.

Ulrich, Lawrence W.; and Walker, Connie W., to Durable Packaging Corporation. Apparatus for sealing cartons. 4,537,649, Cl. 156-355.000.

UMC Industries, Inc.: *See—*
Press, Irving D.; Nickerson, Harvey R.; and Rink, Helm A., 4,537,425, Cl. 285-55.000.

Umezawa, Hamao; Fujii, Akio; Muraoka, Yasuhiko; Nakatani, Tokuji; Fukuoka, Takeyo; and Takahashi, Katsutoshi, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. Aminopropylaminobleomycin derivatives and process for preparation thereof. 4,537,880, Cl. 514-19.000.

Umino, Isamu: *See—*
Yano, Yasuhiro; Umino, Isamu; Ohsawa, Zenichi; and Ozaki, Takayuki, 4,538,121, Cl. 331-25.000.

Underwood, John D., to Monsanto Europe, S.A. Apparatus and method for multiaxial impact testing of materials. 4,537,060, Cl. 73-12.000.

Union Carbide Corporation: *See—*
Manning, David T., 4,537,616, Cl. 71-92.000.
Nowobilski, Jeffert J.; and Owens, William J., 4,537,820, Cl. 428-285.000.

Union Oil Company of California: *See—*
Gallup, Darrell L.; and Jost, John W., 4,537,684, Cl. 210-696.000.

United Kingdom Atomic Energy Authority, The: *See—*
Cole, Geoffrey V., 4,537,547, Cl. 414-5.000.

United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
Bryce, William D., 4,537,277, Cl. 181-214.000.

U.S. Leisure Incorporated: *See—*
Anderson, George F., 4,537,358, Cl. 239-413.000.

United States of America
Army: *See—*
Mariani, Elio A.; Stern, Richard A.; and Babbitt, Richard W., 4,538,123, Cl. 333-208.000.
Energy: *See—*
Abraham, Bernard M.; Miyano, Kenjiro; and Ketterson, John B., 4,537,064, Cl. 73-54.000.
Benett, William J.; and Alger, Terry W., 4,538,277, Cl. 372-33.000.
Christiansen, David W.; Steffen, Jim M.; and Brown, William F., 4,537,741, Cl. 376-261.000.
Colburn, Richard P., 4,537,740, Cl. 376-256.000.
George, E. Victor, 4,538,274, Cl. 372-3.000.
Haney, Steven J.; Stulen, Richard H.; and Toly, Norman F., 4,538,068, Cl. 250-443.100.
Harris, William G., 4,537,249, Cl. 165-134.00R.
Komarneni, Sridhar; and Roy, Della M., 4,537,710, Cl. 252-628.000.
Kulkarni, Satish V.; Christensen, Richard M.; and Toland, Richard H., 4,537,091, Cl. 74-572.000.
Quinby, Thomas C., 4,537,818, Cl. 428-262.000.
Summers, Mark A.; Hagen, Wilhelm F.; and Boyd, Robert D., 4,537,475, Cl. 350-448.000.
Interior: *See—*
Mainiero, Richard J., 4,537,133, Cl. 102-316.000.
National Aeronautics and Space Administration: *See—*
Achar, Bappalige N.; Fohlen, George M.; and Parker, John A., 4,537,834, Cl. 428-413.000.
Carle, Glenn C.; Kojiro, Daniel R.; and Humphry, Donald E., 4,538,066, Cl. 250-374.000.
Collins, Earl R., Jr., 4,537,554, Cl. 414-328.000.
Navy: *See—*
Perry, Huntley H., 4,537,369, Cl. 244-1.00R.
Piercy, William B., 4,537,434, Cl. 294-82.310.
Wehner, Donald R., 4,538,149, Cl. 343-17.20R.

U.S. Philips Corporation: *See—*
Beckmann, Friedrich K.; Hoppe, Wolfgang; and Meyer, Wolfgang, 4,538,125, Cl. 333-248.000.
Gielis, Gerardus C. M.; and Van Kessel, Antoon M. M., 4,538,285, Cl. 375-104.000.
Hollaar, Leendert J.; Zoetman, Herman; and Verbeek, Robert J. M., 4,538,110, Cl. 328-63.000.
Koroncai, Adam; Nowak, Alfred; and Piber, Herbert, 4,536,956, Cl. 30-43.920.
Melai, Henri A. I., 4,538,093, Cl. 315-219.000.
Rehfeldt, Karl H., 4,538,187, Cl. 358-330.000.
Te Velde, Ties S.; and Slob, Arie, 4,536,948, Cl. 29-577.00C.
Wilhelm, Dieter; and Kuhnert, Volker, 4,538,090, Cl. 313-578.000.

United Technologies Corporation: *See—*
Athey, Roy L., 4,536,932, Cl. 29-156.80B.
Bramwell, Frank; and DeSouza, John, 4,538,019, Cl. 174-6.000.
Shuskus, Alexander J.; and Cowher, Melvyn E., 4,537,651, Cl. 156-613.000.

Unitrode Corporation: *See—*
Van Dyk Soerewyn, Herman F., 4,538,168, Cl. 357-72.000.

Universal Automatic Corporation: *See—*
Kancnik, Adolph V.; and Klancnik, Kenneth A., 4,537,289, Cl. 269-34.000.

University of Delaware: *See—*
Sequeira, Hermann B.; and Taylor, Jay E., 4,538,276, Cl. 372-26.000.

University of Florida: *See—*
Drago, Russell S.; Miller, James G.; and Weiss, Keith D., 4,538,011, Cl. 570-240.000.

University of Illinois Foundation: *See—*
Radulovacki, Miodrag, 4,537,907, Cl. 514-567.000.

University of Notre Dame du Lac: *See—*
D'Alelio, Gaetano F., 4,537,947, Cl. 525-424.000.

Uno, Shigeo: *See—*
Kato, Akira; Kamo, Tomoichi; Uno, Shigeo; Kawagoshi, Hiroshi; Yamashita, Hisao; and Matsuda, Shinpei, 4,537,873, Cl. 502-242.000.

UOP Inc.: *See—*
Firth, Bruce E.; and Rosen, Terry J., 4,538,008, Cl. 568-783.000.
Gilson, Jean-Pierre, 4,537,866, Cl. 502-70.000.

Upjohn Company, The: *See—*
Schneider, William P., 4,537,723, Cl. 260-400.000.

Uppstrom, Leif R. Building elements. 4,537,001, Cl. 52-311.000.

Uraneck, Carl A.; and Burleigh, John E., to Phillips Petroleum Company. Rubbery conjugated diene polymers terminated with hydrocarbyl phosphites. 4,537,932, Cl. 524-572.000.

Utsumi, Hitoshi: *See—*
Ooshiro, Takehiko; Iwasaki, Masayoshi; Sahara, Kousuke; Suzuki, Norio; Utsumi, Hitoshi; Miyake, Kazuo; and Aburatani, Kenji, 4,537,073, Cl. 73-602.000.

Utter, Mark S.: *See—*
Short, Robert S.; and Utter, Mark S., 4,538,296, Cl. 381-72.000.

Vahlensieck, Hans-Joachim: *See—*
Seiler, Claus-Dietrich; and Vahlensieck, Hans-Joachim, 4,537,983, Cl. 556-479.000.

Vahlstrom, Richard; and Keats, Dennis R., to Microdata Corporation. Computer operand address computation. 4,538,223, Cl. 364-200.000.

Val Lesina S.p.A.: *See—*
Ballarati, Vito; and Tajana, Franco, 4,537,227, Cl. 139-420.00R.

Valentine, Al L. Pivotal lift apparatus. 4,537,085, Cl. 74-99.00A.

Valeo: *See—*
Loizeau, Pierre, 4,537,298, Cl. 192-106.200.
Loizeau, Pierre, 4,537,579, Cl. 464-68.000.
Loizeau, Pierre; and Caray, Andre , 4,537,580, Cl. 464-68.000.
Renaud, Pierre, 4,537,294, Cl. 192-98.000.

Valmet Oy: *See—*
Eskelinen, Pekka, 4,536,970, Cl. 34-41.000.
Koski, Erkki, 4,537,659, Cl. 162-352.000.
Kulju, Sakari, 4,537,236, Cl. 144-336.000.

Van Arnam, Donald: *See—*
Ang, T. Liem; Van Arnam, Donald; and McFeaters, Earl, 4,537,809, Cl. 428-41.000.

Van Camp, Lucien J. M.: *See—*
Wuyts, Oscar; Ruelens, Remy F.; and Van Camp, Lucien J. M., 4,538,201, Cl. 361-124.000.

van der Lely, Cornelis. Soil cultivation. 4,537,262, Cl. 172-146.000.

VanderPoorte, John G.: *See—*
Tsang, Peter H.; Coyle, Joseph P.; Liu, Tung; and VanderPoorte, John G., 4,537,823, Cl. 428-308.400.

Van Der Puy, Michael; Kolc, Jaroslav F.; Anello, Louis G.; Hendrickson, Larry L.; Rogic, Milorad M.; and Swerdloff, Michael D., to Allied Corporation. S-aryl and S-aliphatic diamidophosphorothiolates as urease inhibitors and urease inhibited urea based fertilizer compositions. 4,537,614, Cl. 71-28.000.

van der Sel, Cornelis: *See—*
Immler, Josef; and van der Sel, Cornelis, 4,538,072, Cl. 250-568.000.

van der Velde, Ype Y.; and Zantinge, Jan, to Tebel Machinefabrieken B.V. Method of preparing a pressed cheese curd having a closed rind. 4,537,787, Cl. 426-478.000.

van der Weerdt, Antonius J. A.; and Renes, Harrie, to Naarden International N.V. Perfume and flavoring compositions, perfumed articles and materials, and flavored food products containing an oxaspirodecadiene derivative as the essential compound, as well as the oxaspiro[4.5]decadiene derivative per se. 4,537,702, Cl. 252-522.00R.

Van de Sande, Christian C.; Verhecken, Andre ; and Janssens, Wilhelmus, to Agfa-Gevaert, N.V. Photographic silver halide material containing a ballasted electron-donor precursor compound. 4,537,853, Cl. 430-218.000.

Van Dyk Soerewyn, Herman F., to Unitrode Corporation. High power semiconductor package. 4,538,168, Cl. 357-72.000.

VanGieson, Franklin D.: *See—*
Gray, Bruce; Soundaranathan, Kasivisvanatha; and VanGieson, Franklin D., 4,536,945, Cl. 29-571.000.

Van Heeckeren, Walraven. Tuneable tuned pipe exhaust system. 4,537,279, Cl. 181-241.000.

Van Kessel, Antoon M. M.: *See—*
Gielis, Gerardus C. M.; and Van Kessel, Antoon M. M., 4,538,285, Cl. 375-104.000.

Varadarajan, Hemmige D., to Advanced Micro Devices, Inc. High speed referenceless bipolar logic gate with minimum input current. 4,538,075, Cl. 307-454.000.

Varian Associates, Inc.: *See—*
Holden, Scott C., 4,537,244, Cl. 165-1.000.

Varndell, Sydney A.; Lawson, Douglas R.; and Fountain, Michael W., to Thomas Jourdan PLC. Mattress with apertured insert. 4,536,906, Cl. 5-468.000.

Varone, Richard B. Cable failure detection system. 4,538,107, Cl. 324-206.000.

Varos, John A.: *See—*
Barnett, Steve M.; Flowers, Michael A.; and Varos, John A., 4,536,890, Cl. 2-164.000.

Varwig, Juergen: *See—*
Seufert, Walter; Varwig, Juergen; Seppelt, Wolfgang; and Adolphi, Heinrich, 4,537,884, Cl. 514-127.000.

Vassarotti, Enzo: *See—*
Bortolani, Ermanno; Brembilla, Sandro; and Vassarotti, Enzo, 4,537,011, Cl. 53-509.000.

Vaszovics nee Reichmann, Gyorgyi: *See—*
Deak, Gyula; Zara nee Kaczian, Erzsebet; Gyorgy, Lajos; Fekete, Marton; Doda, Margit; Seregi, Andras; Kanyicska, Bela; Toth nee Pecsi, Erzsebet; Horvath nee Gaal, Maria; Manyai, Sandor; Gorgenyi, Frigyes; and Vaszovics nee Reichmann, Gyorgyi, 4,537,895, Cl. 514-307.000.

Veal, Gordon R.: *See—*
Hirasuna, Alan R.; and Veal, Gordon R., 4,537,406, Cl. 277-1.000.

Venkateswaran, Kalyanasundaram, to Fairchild Research Center. Redundant rows in integrated circuit memories. 4,538,247, Cl. 365-230.000.

Verbeek, Robert J. M.: *See—*
Hollaar, Leendert J.; Zoetman, Herman; and Verbeek, Robert J. M., 4,538,110, Cl. 328-63.000.

Vercaemer, Claude J.: *See—*
Parcevaux, Philippe A.; Piot, Bernard M.; and Vercaemer, Claude J., 4,537,918, Cl. 523-130.000.

Verduin, Lee C.; and St. Clair, Michael J., to Rowe International, Inc. Control system for cold drink merchandising machine. 4,537,336, Cl. 222-641.000.

Verhecken, Andre : *See—*
Van de Sande, Christian C.; Verhecken, Andre ; and Janssens, Wilhelmus, 4,537,853, Cl. 430-218.000.

Verjux, Jean, to Decoufle S.A.R.L. Cutting guide for cigarette making machines. 4,537,205, Cl. 131-280.000.

Verschoof, Karel J. H.; and Smit, Jan W. Contraceptive device. 4,537,186, Cl. 128-130.000.

Vertenten, Edward; and Heft, Josef, to Siemens Aktiengesellschaft. Electrical connector. 4,537,455, Cl. 339-99.00R.

Vicenzi, Reno L., to Figgie International Inc. Breathing device. 4,537,189, Cl. 128-202.130.

Vickers, Incorporated: *See—*
Gunda, Rajamouli; McCarty, Michael R.; and Rode, Melvin A., 4,537,029, Cl. 60-390.000.

Victor Company of Japan, Limited: *See—*
Shiramizu, Takami, 4,537,108, Cl. 84-1.010.

Vidal, Stella M. Device with pouches for receiving animal waste. 4,537,153, Cl. 119-95.000.

Videocolor: *See—*
Fourche , Jean-Pierre; and Milili, Marc, 4,538,128, Cl. 335-210.000.

Villain, Juergen: *See—*
Kehrer, Hans-Peter, Villain, Juergen; and Reiff, Werner, 4,537,793, Cl. 427-35.000.

Virginia Panel Corporation: *See—*
Coiner, Russell E.; and Moore, Thomas W., 4,537,463, Cl. 339-276.00A.

Viscardi, Ettore, to Somet Societa' Meccanica Tessile S.p.A. Weft presenting device for weaving looms. 4,537,228, Cl. 139-453.000.

Voest Alpine AG: *See—*
Ketterer, Klaus, 4,537,448, Cl. 299-81.000.

Voest-Alpine Aktiengesellschaft: *See—*
Fohler, Johann, 4,537,072, Cl. 73-432.00R.
Zitz, Alfred; Schetina, Otto; and Wrulich, Herwig, 4,537,447, Cl. 299-1.000.

Volkamer, Klaus: *See—*
Wagner, Eckhart; Volkamer, Klaus; and Wagner, Ulrich, 4,537,753, Cl. 423-228.000.

Volker, Wolfgang; and Glastra, Hendrik, to Messer Griesheim GmbH. Procedure for creating an inert gas atmosphere with constant composition of nitrogen and carbon dioxide in a refrigerated container. 4,537,043, Cl. 62-239.000.

Volks, Gunter, to BBC Brown, Boveri & Company, Limited. Vertical, collector-type high-pressure feed water preheater, with a desuperheater casing. 4,537,157, Cl. 122-412.000.

VonGrunberg, Hubertus; Rowell, Jonathan M.; and Corey, Frederick C., to International Telephone and Telegraph Corporation. Dust boot for a disc-brake actuating cylinder-and-piston unit. 4,537,289, Cl. 188-97.400.

Vroonland, Evart. J.; and Curtis, William M., to Continental Emsco Company. Spring balance assembly. 4,537,233, Cl. 141-387.000.

Vyne, Robert L., to Motorola, Inc. Output stage for an operational amplifier. 4,538,116, Cl. 330-271.000.

W. R. Grace & Co.: *See—*
Heinemann, Frederick F.; and Gavin, Thomas O., 4,537,129, Cl. 101-415.100.
Lin, Shiow C., 4,537,805, Cl. 427-54.100.

W. R. Grace & Co., Cryovac Div.: *See—*
Bortolani, Ermanno; Brembilla, Sandro; and Vassarotti, Enzo, 4,537,011, Cl. 53-509.000.

W.W.B. Developers: *See—*
Combs, Linsey L., 4,537,555, Cl. 414-463.000.

Wada, Shozo: *See—*
Shiino, Kouji; Hashimoto, Nobuo; Wada, Shozo; Nakamura, Keijiro; Izumi, Akio; Sato, Toshio; and Matsui, Takashi, 4,537,648, Cl. 156-351.000.

Wagner, Eckhart; Volkamer, Klaus; and Wagner, Ulrich, to BASF Aktiengesellschaft. Removal of CO_2 and H_2S from natural gases. 4,537,753, Cl. 423-228.000.

Wagner, Ulrich: *See—*
Wagner, Eckhart; Volkamer, Klaus; and Wagner, Ulrich, 4,537,753, Cl. 423-228.000.

Wahl, Georg: *See—*
Gross, Franz; Wahl, Georg; and Nicoll, Andrew R., 4,537,744, Cl. 420-446.000.

Wainwright, Barry. Aerofoils. 4,537,146, Cl. 114-103.000.

Wakamoto Pharmaceutical Co., Ltd.: *See—*
Nozawa, Koohei; Yoshizawa, Toyokichi; and Kuroda, Toshio, 4,537,967, Cl. 546-141.000.

Waldhecker, Heinz-Dieter: *See—*
Pfeiffer, Roland; and Waldhecker, Heinz-Dieter, 4,537,626, Cl. 75-35.000.

Walker, Connie W.: *See—*
Ulrich, Lawrence W.; and Walker, Connie W., 4,537,649, Cl. 156-355.000.

Walker, David: *See—*
Oberle, Patrick; Longuet, Michel; and Walker, David, 4,537,915, Cl. 521-84.100.

Walker, Gary E.: *See—*
Sharp, Harper E.; Spiegel, Leo; Masters, Richard M.; Frey, Elmer J.; Howatt, John R.; and Walker, Gary E., 4,537,067, Cl. 73-151.000.

Walker, Joe M.; and Potts, Thomas M., to Eagle-Picher Industries, Inc. Production of elemental silicon from impure silane feed. 4,537,759, Cl. 423-349.000.

Walker, John R.: *See—*
Hawe, Malcolm; Marshall, David; and Walker, John R., 4,537,695, Cl. 252-70.000.

Walker, Leigh E.; and Ranade, Gautam R., to Occidental Chemical Corporation. Blends of polyolefin graft polymers and ASA polymers. 4,537,933, Cl. 525-71.000.

Walker Process Corporation: *See—*
Thissen, Christopher P., 4,537,678, Cl. 210-150.000.

Wallace Expanding Machines, Inc.: *See—*
Roper, Ralph E., 4,536,931, Cl. 29-90.00R.

Waller, James, Jr. Aurally sensitized flat frequency response noise reduction compansion system. 4,538,297, Cl. 381-94.000.

Waltzer, Jeremy. Support bracket for electronic remote control module. 4,537,340, Cl. 224-202.000.

Wambach, Hermann: *See—*
Rekewitz, Rudolf; and Wambach, Hermann, 4,537,521, Cl. 400-637.600.

Wa. ɜ Laboratories, Inc.: *See—*
Lena, Richard M., 4,538,112, Cl. 329-145.000.

Wang, Ming-Sheng. Automatic straw-emerging device for easy-to-open beverage can of press-down type sealing tap. 4,537,324, Cl. 220-90.200.

Wang, Samuel T.; Hu, Chenming; and Shum, Ying, to National Semiconductor Corporation. Nonvolatile memory cell. 4,538,246, Cl. 365-226.000.

Wanner, Karl: *See—*
Schmid, Wolfgang; Wanner, Karl; Falchle, Jorg; Bleicher, Manfred; and Muller, Frank, 4,537,264, Cl. 173-48.000.

Ward, Carl E., to Chevron Research Company. Herbicidal 2-(oxa or thia heterocycle)5-amino-3-oxo-4-(substituted-phenyl)-2,3-dihydrofurans. 4,537,623, Cl. 71-90.000.

Ward, Francis P. Shade cloth pin inserter. 4,536,934, Cl. 29-278.000.

Ward, Patrick C.: *See—*
Lewis, George A.; Collins, Kent L.; Benesh, Joseph C.; and Ward, Patrick C., 4,538,091, Cl. 313-625.000.

Warszawski, Bernard. Electrosensitive media and recording process. 4,538,158, Cl. 346-135.100.

Wassall, Michael P.: *See—*
Lersmacher, Bernhard; Wassall, Michael P.; and Connor, Philip J., 4,537,506, Cl. 356-312.000.

Watanabe, Eiji: *See—*
Takagi, Toshijiro; and Watanabe, Eiji, 4,537,477, Cl. 350-507.000.

Watanabe, Hideo: *See—*
Takigawa, Nobuhiro; Watanabe, Hideo; Kawasaki, Kanzirou; Kubo, Keishi; Hakiri, Minoru; and Kawamura, Eiichi, 4,538,164, Cl. 346-209.000.

Watanabe, Kenji: *See—*
Asano, Masao; Fujimatsu, Wataru; Matsumoto, Kazumasa; Murata, Hideki; Sato, Toshihiko; and Watanabe, Kenji, 4,537,824, Cl. 428-323.000.

Wate:man, David K., to Rohrback Corporation. Retriever tool. 4,537,071, Cl. 73-432.00R.

Waterman, Harold J., Jr.: *See—*
Bredbury, Seth K.; and Waterman, Harold J., Jr., 4,536,982, Cl. 42-71.00R.

Waters, Gary A.: *See—*
Cuomo, Jerome J.; Harper, James M. E.; and Waters, Gary A., 4,538,067, Cl. 250-396.00R.

Watkiss Automation Limited: *See—*
Watkiss, Christopher R.; and Watkiss, Michael C., 4,537,391, Cl. 271-101.000.

Watkiss, Christopher R.; and Watkiss, Michael C., to Watkiss Automation Limited. Rotary collating and/or inserting machines and method of collating and/or inserting sheet material. 4,537,391, Cl. 271-101.000.

Watkiss, Michael C.: *See—*
Watkiss, Christopher R.; and Watkiss, Michael C., 4,537,391, Cl. 271-101.000.

Watson, Francis M., to Honeywell Ltd. Skylight sensor and control system. 4,538,218, Cl. 362-802.000.

Watson, James M.: *See—*
Butler, James R.; and Watson, James M., 4,538,017, Cl. 585-415.000.

Watt, Brian J.: *See—*
Chen, Jade; Birdy, Jal N.; and Watt, Brian J., 4,537,532, Cl. 405-217.000.

Watthey, Jeffrey W. H., to Ciba Geigy Corporation. Certain benzazocinone and benzazoninone derivatives. 4,537,885, Cl. 514-183.000.

Webasto-Werk W. Baier GmbH & Co.: *See*—
Jardin, Hans, 4,537,442, Cl. 296-221.000.
Weber, Dietmar: *See*—
Barnicol-Ottler, Max; Loczenski, Martin; Mieschke, Norbert; Ott, Gerhard; Przybylski, Gerhard; and Weber, Dietmar, 4,538,022, Cl. 174-113.00R.
Weber, Gerhard M.: *See*—
Kivel, Daniel M.; and Weber, Gerhard M., 4,537,926, Cl. 524-388.000.
Weber, Gunter, to Linde Aktiengesellschaft. Method for removing hydrogen sulfide from gas streams. 4,537,752, Cl. 423-224.000.
Weber, Hans: *See*—
Bergmann, Udo; Degen, Helmut; Hansen, Guenter; Krallmann, Reinhold; and Weber, Hans, 4,537,597, Cl. 8-639.000.
Weber, Harold J., to Coulter Systems Corporation. Corona producing method and apparatus. 4,538,204, Cl. 361-229.000.
Wedding, Brent M.: *See*—
Borrelli, Nicholas F.; Hares, George B.; Smith, Dennis W.; and Wedding, Brent M., 4,537,612, Cl. 65-30.110.
Wedtech Corp.: *See*—
Pinkhasov, Eduard, 4,537,794, Cl. 427-37.000.
Wegman, Mark N.: *See*—
Carter, John L.; Markowsky, George; and Wegman, Mark N., 4,538,240, Cl. 364-754.000.
Wehner, Donald R., to United States of America, Navy. Frequency agile magnetron imaging radar. 4,538,149, Cl. 343-17.20R.
Wei, Chung-Chen; and Weigele, Manfred, to Hoffmann-La Roche Inc. Imidazole derivatives. 4,537,969, Cl. 546-210.000.
Weigele, Manfred: *See*—
Wei, Chung-Chen; and Weigele, Manfred, 4,537,969, Cl. 546-210.000.
Weiner, Lewis. Motion picture film movement apparatus. 4,537,482, Cl. 352-186.000.
Weirich, Walter; and Dettmers, Michael, to Gewerkschaft Eisenhutte Westfalia. Hydraulic control devices for use with mining apparatus. 4,537,221, Cl. 137-637.200.
Weisbrod, Helmut: *See*—
Thiel, Rudolf; Weisbrod, Helmut; and Braehler, Hermann, 4,537,291, Cl. 188-73.380.
Weiss, Keith D.: *See*—
Drago, Russell S.; Miller, James G.; and Weiss, Keith D., 4,538,011, Cl. 570-240.000.
Werner, Raymond E.: *See*—
Rebhahn, Robert W. J.; Kassner, James E.; and Werner, Raymond E., 4,537,971, Cl. 546-320.000.
West, John B.: *See*—
Soden, Laurence M.; and West, John B., 4,536,996, Cl. 52-67.000.
Westcode, Inc.: *See*—
James, Benjamin B.; and Peel, Edward, 4,538,038, Cl. 200-61.710.
Westergart, Chester V.: *See*—
Douglas, Bruce S.; and Westergart, Chester V., 4,538,104, Cl. 324-158.00F.
Westinghouse Corp.: *See*—
Dakin, Thomas W.; Studniarz, Stanley A.; and Chenoweth, Terrence E., 4,537,803, Cl. 427-385.500.
Westinghouse Electric Corp.: *See*—
Bone, George D., Jr., 4,538,150, Cl. 343-17.700.
Elmore, Walter A., 4,538,195, Cl. 361-64.000.
Gyugyi, Laszlo, 4,538,220, Cl. 363-161.000.
Hruda, Robert M., 4,537,662, Cl. 204-1.00R.
Lee, Pang K.; and Hickam, William M., 4,537,661, Cl. 204-1.00T.
Mayer, Donald K., 4,537,045, Cl. 62-503.000.
Morris, Arnold M.; and Trivedi, Jitendra K., 4,537,286, Cl. 187-1.00A.
Murray, Alexander P.; and Snyder, Thomas S., 4,537,666, Cl. 204-129.950.
Staehlin, John H., 4,538,154, Cl. 343-705.000.
Sun, Shan C.; and Garitty, James P., 4,538,196, Cl. 361-64.000.
Wilhelm, John J.; Kapoor, Anoop; Kobuck, Richard M.; Antol, Ronald F.; and Norris, George W., 4,537,711, Cl. 252-633.000.
Westley, John: *See*—
Liu, Chao-Min; and Westley, John, 4,537,956, Cl. 536-1.100.
White, Alfred J.: *See*—
Ty, Henry; and White, Alfred J., 4,537,365, Cl. 242-107.600.
White, Christopher R. Wind propelled vessel. 4,537,145, Cl. 114-91.000.
White, Eugene B., Jr., to White Machinery Corporation. Combination railcar moving vehicle and trailer spotter. 4,537,137, Cl. 105-26.00R.
White, James N. J.; and Caithness, Michael G., to Rodime Limited. Ventilation system for computer disc drive hub assembly. 4,538,192, Cl. 360-98.000.
White, John F.: *See*—
Shum, Wilfred P.; White, John F.; and Beals, Eva M., 4,537,998, Cl. 568-483.000.
White Machinery Corporation: *See*—
White, Eugene B., Jr., 4,537,137, Cl. 105-26.00R.
White, Robert N.: *See*—
Uffner, William E.; White, Robert N.; and Harrington, Edward R., 4,537,921, Cl. 524-59.000.
Whitehead, Larry W., to Leggett & Platt, Incorporated. Foldable bed frame. 4,536,904, Cl. 5-201.000.
Whitfield, Richard G.: *See*—
Cooke, Theodore M.; Lin, Robert A.; Whitfield, Richard G.; and Hock, Allan G., 4,537,631, Cl. 106-22.000.
Whitney, Daniel E., to Charles Stark Draper Laboratory, Inc., The. Remote center compliance gripper system. 4,537,557, Cl. 414-735.000.
Whitney, Ralph H., to Owens-Illinois, Inc. Concentric tamper-indicating band. 4,537,319, Cl. 215-252.000.
Whittam, Thomas V.: *See*—
Casci, John L.; Lowe, Barrie M.; and Whittam, Thomas V., 4,537,754, Cl. 423-277.000.
Wiacek, Marian; Markin, Charles; and Book, Ronald J., to Duracell Inc. Metal-supported seals for galvanic cells. 4,537,841, Cl. 429-56.000.
Widrow, Bernard, to Leland Stanford Junior University, The Board of Trustees of the. ECG enhancement by adaptive cancellation of electrosurgical interference. 4,537,200, Cl. 128-696.000.
Wiegers, Wilhelmus J.: *See*—
Sprecker, Mark A.; Wiegers, Wilhelmus J.; Belko, Robert P.; and Boden, Richard M., 4,537,704, Cl. 252-522.00R.
Wiggins, Douglas G., to Xerox Corporation. Platen cover for document boundary detection in raster scanners. 4,538,185, Cl. 358-285.000.
Wiggins Teape Group Limited, The: *See*—
Shanton, Kenneth J., 4,537,797, Cl. 427-150.000.
Wild, Gene M.: *See*—
Baltz, Richard H.; Wild, Gene M.; and Seno, Eugene T., 4,537,957, Cl. 336-7.100.
Wilde, Eugen: *See*—
Schreder, Felix; Dorner, Leonhard; and Wilde, Eugen, 4,538,051, Cl. 219-466.000.
Wilhelm, Dieter; and Kuhnert, Volker, to U.S. Philips Corporation. Lamp/reflector unit. 4,538,090, Cl. 313-578.000.
Wilhelm, John J.; Kapoor, Anoop; Kobuck, Richard M.; Antol, Ronald F.; and Norris, George W., to Westinghouse Electric Corp. Fuel assembly skeleton compaction. 4,537,711, Cl. 252-633.000.
Wilker, Paul S.: *See*—
Benning, Gordon D.; Pascas, Brian J.; Blackhall, Robert K.; Wilker, Paul S.; and Neathway, Graham A., 4,538,031, Cl. 179-81.00B.
Wilkins, Ebtisam S.; and Wilkins, Michael G. Polymer-gel covered solar energy collector and storage unit. 4,537,179, Cl. 126-415.000.
Wilkins, Michael G.: *See*—
Wilkins, Ebtisam S.; and Wilkins, Michael G., 4,537,179, Cl. 126-415.000.
Wilkinson, William R.; and Sharp, Russell G., to Sharp, Russell G. Seamless suppository dispenser. 4,537,311, Cl. 206-529.000.
Willamette Industries, Inc.: *See*—
Gale, Ronald S.; Bristol, William E.; and Noonan, Carroll, 4,537,586, Cl. 493-220.000.
Willett, Paul E., to Baker Perkins Exports Pty. Ltd. Baker's oven. 4,538,050, Cl. 219-388.000.
Williams, Gary L.: *See*—
Armstrong, Gordon P.; Flautt, Martin C.; and Williams, Gary L., 4,537,107, Cl. 83-694.000.
Williams, Haydn W. R.: *See*—
Cragoe, Edward J., Jr.; Rooney, Clarence S.; and Williams, Haydn W. R., 4,537,902, Cl. 514-422.000.
Williams, James E.: *See*—
Lubinsky, Anthony R.; Denton, Gary A.; Keller, Paul D.; and Williams, James E., 4,537,494, Cl. 355-3.0DD.
Williams, James T., Jr. Portable orthopaedic splint system. 4,537,184, Cl. 128-90.000.
Williams, Richard J., to Rockwell International Corporation. Method of forming a brake drum. 4,536,936, Cl. 29-447.000.
Williamson, Andrew H., Jr., to AT&T Bell Laboratories, Inc. Cable closure having asymmetrical end plate assembly. 4,538,021, Cl. 174-92.000.
Willoughby, Patrick. One piece clamping device. 4,536,924, Cl. 24-487.000.
Wilson, Daniel C., to Dow Chemical Company, The. Liquid air freshener dispenser. 4,537,351, Cl. 239-43.000.
Wilson Industries, Inc.: *See*—
Sharp, Harper E.; Spiegel, Leo; Masters, Richard M.; Frey, Elmer J.; Howatt, John R.; and Walker, Gary E., 4,537,067, Cl. 73-151.000.
Wilverly Mansions I.B.V.: *See*—
Gelbard, Edward, 4,537,330, Cl. 221-26.000.
Windmoller & Holscher: *See*—
Tetenborg, Konrad; and Eschmann, Heinz, 4,537,013, Cl. 53-570.000.
Winkler & Dunnerbier Maschinenfabrik und Eisengiesserei GmbH & Co. KG.: *See*—
Ehlscheid, Gunter; and Frost, Heinz-Helmut, 4,537,588, Cl. 493-342.000.
Winter, Joseph: *See*—
Pryor, Michael J.; Winter, Joseph; and Dantzig, Jonathan A., 4,537,242, Cl. 164-460.000.
Wirth, Wulf D., to Siemens Aktiengesellschaft. Surveillance radar system which is protected from anti-radar missiles. 4,538,152, Cl. 343-5.0VQ.
Wise, Daniel J.; and Woodhall, Donna M., to Ex-Cell-O Corporation. Laminated paperboard container with absorption resistance means, and blank for constructing same. 4,537,815, Cl. 428-219.000.
Wise, Joseph A.; and Green, Michael P., to AMP Incorporated. Flat multiconductor cable extruded on a wheel. 4,538,024, Cl. 174-117.00F.
Wisecarver, Martin L.: *See*—
Moisson, Marc F.; and Wisecarver, Martin L., 4,537,466, Cl. 350-96.200.
Wittbrodt, Edwin L.: *See*—
Bruschtein, Fabio B.; Jahn, Robert G.; and Wittbrodt, Edwin L., 4,537,916, Cl. 523-201.000.

Witte, Josef: *See—*
Starzewski, Karl-Heinz A. O.; and Witte, Josef, 4,537,982, Cl. 556-22.000.
Witty, Craig D. Process and apparatus for creating traveling mattes. 4,537,481, Cl. 352-89.000.
Wolf, Rudiger: *See—*
Albrecht, Wolf-Wigand; Hoppe, Axel; Papp, Uwe; and Wolf, Rudiger, 4,537,641, Cl. 148-11.50P.
Wong-Chong, George M., to Environmental Research & Technology. Activated sludge wastewater treating process. 4,537,682, Cl. 210-611.000.
Wood, John F. B.: *See—*
Hazelett, Robert W.; and Wood, John F. B., 4,537,243, Cl. 164-481.000.
Woodhall, Donna M.: *See—*
Wise, Daniel J.; and Woodhall, Donna M., 4,537,815, Cl. 428-219.000.
Woodrow, Harold E.; and Smola, Raymond L., to Morgan Construction Company. Single strand block-type rolling mill. 4,537,055, Cl. 72-235.000.
Workman, Eleanor. Flexible insulated container. 4,537,313, Cl. 206-545.000.
Worth, Sidney V., to Continental-Wirt Electronics Corp. Conductive shielding housing for flat cable connector. 4,537,458, Cl. 339-143.00R.
WPM, Inc.: *See—*
Bock, Robert E., 4,537,360, Cl. 239-553.300.
Wright, Beaumont B.: *See—*
Estes, Roy D.; and Wright, Beaumont B., 4,537,409, Cl. 277-83.000.
Wright, John D.: *See—*
Burroughs, Robert H.; Wright, John D.; Secunda, Jeffrey A.; and Newbower, Ronald S., 4,537,128, Cl. 101-407.0BP.
Wrobel, Joseph J.: *See—*
Gupta, Mool C.; Wrobel, Joseph J.; and Howe, Dennis G., 4,538,159, Cl. 346-135.100.
Wrobel, Stanley A.; and Ashton, Robert G., to Dwyer Instruments, Inc. Thermal anemometer. 4,537,068, Cl. 73-202.000.
Wrulich, Herwig: *See—*
Zitz, Alfred; Schetina, Otto; and Wrulich, Herwig, 4,537,447, Cl. 299-1.000.
Wuerzer, Bruno: *See—*
Parg, Adolf; Ziegler, Hans; and Wuerzer, Bruno, 4,537,621, Cl. 71-103.000.
Plath, Peter; Eicken, Karl; Sauter, Hubert; and Wuerzer, Bruno, 4,537,617, Cl. 71-92.000.
Wuyts, Oscar; Ruelens, Remy F.; and Van Camp, Lucien J. M., to International Standard Electric Corporation. Surge protector. 4,538,201, Cl. 361-124.000.
Wyle, Charles; Shea, Donald M.; and Best, Norman D., to Charles Wyle Engineering Corporation. Apparatus for moving, handling and mounting attachments onto a length of flexible material. 4,536,935, Cl. 29-281.100.
Xanthopoulos, Piritheos E., to Medical Technology, Ltd. Peristaltic infusion pump and disposable cassette for use therewith. 4,537,561, Cl. 417-63.000.
Xerox Corporation: *See—*
Coons, Robert A., Jr., 4,537,650, Cl. 156-384.000.
Klinger, Lance T., 4,538,257, Cl. 369-106.000.
Lubinsky, Anthony R.; Denton, Gary A.; Keller, Paul D.; and Williams, James E., 4,537,494, Cl. 355-3.0DD.
Ritter, Joachim A.; Bock, Edward C.; Spinelli, Richard A.; and Dennis, John R., 4,537,499, Cl. 355-58.000.
Sheridon, Nicholas K., 4,538,163, Cl. 346-155.000.
Wiggins, Douglas G., 4,538,185, Cl. 358-285.000.
Yourd, Raymond A., III; Majumdar, Debesh; and Gruber, Robert J., 4,537,848, Cl. 430-110.000.
Yada, Hiroshi: *See—*
Tominaga, Jiro; Yada, Hiroshi; and Honda, Mitsuo, 4,537,644, Cl. 148-36.000.
Yahara, Shoji: *See—*
Kooda, Akihide; Nishioka, Itsuo; Nishiyori, Takeshi; and Yahara, Shoji, 4,537,996, Cl. 568-442.000.
Yamada, Junichi: *See—*
Morita, Hiroshi; Kawada, Yasuyuki; Yamada, Junichi; and Ukigai, Toshiyuki, 4,537,253, Cl. 166-274.000.
Yamada, Keiichi; and Kimura, Hideyuki, to Diesel Kiki Co., Ltd. Distribution type fuel injection pump. 4,537,170, Cl. 123-449.000.
Yamada, Takeshi: *See—*
Akaba, Hayao; Yamada, Takeshi; and Jinbo, Masahiro, 4,537,480, Cl. 351-235.000.
Yamada, Tominori: *See—*
Yamato, Isao; and Yamada, Tominori, 4,537,564, Cl. 417-313.000.
Yamada, Yoshio: *See—*
Otani, Kozo; and Yamada, Yoshio, 4,537,945, Cl. 528-68.000.
Yamagami, Nobuhiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Graphic display device having graphic generator for shading graphs. 4,538,144, Cl. 340-747.000.
Yamaguchi, Fumio: *See—*
Matsuura, Ichiro; and Yamaguchi, Fumio, 4,537,863, Cl. 501-15.000.
Yamaguchi, Ryoji: *See—*
Kamiya, Masashi; Sumiya, Mitsuo; and Yamaguchi, Ryoji, 4,538,081, Cl. 310-90.000.
Yamaguchi, Tadashi; Ono, Takayuki; Hirata, Michitoshi; and Yokoyama, Toshihiko, to Tohoku Metal Industries, Ltd.; and Taisei Corporation. Magnetically traceable explosives with stability and a method for the preparation thereof. 4,537,645, Cl. 149-3.000.
Yamamoto, Hachizou: *See—*
Iwagami, Kenji; and Yamamoto, Hachizou, 4,538,057, Cl. 235-379.000.
Yamamoto, Kazuo: *See—*
Nakamura, Hiromi; Takahashi, Takehiko; Narazaki, Norio; Yamamoto, Kazuo; and Sayama, Norio, 4,537,023, Cl. 60-39.050.
Yamamoto, Keisaku: *See—*
Takao, Hiroyoshi; Yamamoto, Keisaku; Imai, Akio; Yoshida, Nobuyuki; Furukawa, Hiroshi; Saito, Yuichi; and Okumura, Akio, 4,537,936, Cl. 525-236.000.
Yamamoto, Michihiro: *See—*
Ono, Keiichi; Sugie, Akihiko; Muraoka, Masami; and Yamamoto, Michihiro, 4,537,989, Cl. 562-501.000.
Yamamoto, Minoru: *See—*
Ootsuka, Yoshinori; Hattori, Tadashi; Yamamoto, Minoru; and Ozaki, Tadashi, 4,537,065, Cl. 73-117.300.
Yamamoto, Nobuyuki: *See—*
Kasuga, Akira; Yamamoto, Nobuyuki; and Miyatsuka, Hajime, 4,537,833, Cl. 428-328.000.
Yamamoto, Susumu; and Sato, Kazuyoshi, to Sumitomo Electric Industries, Ltd. Electrically conductive composite material. 4,537,808, Cl. 428-36.000.
Yamamoto, Takashi: *See—*
Shinryo, Yuko; and Yamamoto, Takashi, 4,536,952, Cl. 29-596.000.
Yamamoto, Takeshi; and Sakata, Hideo, to Mitutoyo Mfg. Co., Ltd. Digital indication type measuring machine. 4,536,963, Cl. 33-178.00E.
Yamamura, Kazuomi; Ishihara, Hideo; Iwamoto, Yoshinao; Sakaguchi, Hifumi; Morita, Masao; and Izawa, Toshio, to Kokusai Denshin Denwa Co., Ltd. Marine cable burying method and device therefor. 4,537,530, Cl. 405-160.000.
Yamamura, Takeshi: *See—*
Takayama, Yoshihisa; Gotoh, Kunihiko; Ito, Akihiko; Yamamura, Takeshi; and Fujita, Kazuyoshi, 4,536,949, Cl. 29-578.000.
Yamanaka, Takashi; Takeya, Yasushi; Yorita, Mitsumasa; Horiuchi, Toshiaki; Inagaki, Kouichi; Naya, Eizo; Demizu, Michinosuke; and Okumura, Mitsuhiro, to Mitsubishi Denki Kabushiki Kaisha. Electrode composition for vacuum switch. 4,537,743, Cl. 419-38.000.
Yamashita, Hisao: *See—*
Kato, Akira; Kamo, Tomoichi; Uno, Shigeo; Kawagoshi, Hiroshi; Yamashita, Hisao; and Matsuda, Shinpei, 4,537,873, Cl. 502-242.000.
Yamato, Isao; and Yamada, Tominori, to Mitsui Engineering & Shipbuilding Co., Ltd. Pumping system for oil production. 4,537,564, Cl. 417-313.000.
Yamauchi, Junichi: *See—*
Omura, Ikuo; Yamauchi, Junichi; Nagase, Yoshinori; and Uemura, Fumiko, 4,537,940, Cl. 526-278.000.
Yang, Sung H. Auxiliary handle for a shovel. 4,537,433, Cl. 294-58.000.
Yano, Yasuhiro; Umino, Isamu; Ohsawa, Zenichi; and Ozaki, Takayuki, to Fujitsu Limited. High frequency generator with output shut-off or reduced by biasing multiplier diode. 4,538,121, Cl. 331-25.000.
Yao, Yugo: *See—*
Tanaka, Masaho; Shishido, Tomio; Fukuhara, Tetsukazu; Yao, Yugo; Kobayashi, Kunihilo; and Inoue, Yoshio, 4,538,042, Cl. 219-58.000.
Yardley, James F., to Dunlop Limited. Bonded composites of a thermoplastic elastomeric blend with a vulcanized epom or epm rubber composition. 4,537,825, Cl. 428-327.000.
Yasuda, Naohiko: *See—*
Kato, Toshihisa; Iwagami, Hisao; and Yasuda, Naohiko, 4,537,719, Cl. 260-239.00A.
Yasue, Kazuo, to NEC Corporation. Loop back system for loop transmission line, 4,538,026, Cl. 178-2.00R.
Yasui, Eiji: *See—*
Ohmori, Tadashi; Fujiso, Tokuo; Yasui, Eiji; Nomura, Soichi; and Aizawa, Yukio, 4,537,872, Cl. 502-230.000.
Yau, Leo D.: *See—*
Bohr, Mark T.; Yu, Ken K.; Yau, Leo D.; and Garg, Shyam G., 4,536,947, Cl. 29-576.00C.
Yavordios, Dimitri: *See—*
Heinemann, Henning; Jasserand, Daniel; Milkowski, Wolfgang; Yavordios, Dimitri; and Zeugner, Horst, 4,537,975, Cl. 548-359.000.
Yerman, Alexander J., to General Electric Company. Power chip package. 4,538,170, Cl. 357-80.000.
Yokoyama, Toshihiko: *See—*
Yamaguchi, Tadashi; Ono, Takayuki; Hirata, Michitoshi; and Yokoyama, Toshihiko, 4,537,645, Cl. 149-3.000.
Yorita, Mitsumasa: *See—*
Yamanaka, Takashi; Takeya, Yasushi; Yorita, Mitsumasa; Horiuchi, Toshiaki; Inagaki, Kouichi; Naya, Eizo; Demizu, Michinosuke; and Okumura, Mitsuhiro, 4,537,743, Cl. 419-38.000.
York, Billie M., Jr., to Alcon Laboratories, Inc. Spiro-tricyclicaromatic succinimide derivatives as inhibitors of aldose reductase. 4,537,892, Cl. 514-278.000.
York, Paul W.: *See—*
Gutschmit, Alan; and York, Paul W., 4,537,048, Cl. 66-93.000.
Yoshida Kogyo K. K.: *See—*
Gartner, Karl, 4,537,000, Cl. 52-235.000.
Yoshida Kogyo K.K.: *See—*
Murakami, Shoetsu, 4,536,923, Cl. 24-433.000.
Yoshida, Nobuyuki: *See—*
Takao, Hiroyoshi; Yamamoto, Keisaku; Imai, Akio; Yoshida, Nobuyuki; Furukawa, Hiroshi; Saito, Yuichi; and Okumura, Akio, 4,537,936, Cl. 525-236.000.

Yoshikawa, Hisao: *See*—
Shimizu, Masami; Yoshikawa, Hisao; Kimura, Sosaku; Shiba, Kazuo; Maeno, Fumio; Fuwa, Shigehiro; and Mihara, Kuniyuki, 4,536,993, Cl. 51-165.800.

Yoshimi, Akirou: *See*—
Nishimura, Masao; Mori, Masami; and Yoshimi, Akirou, 4,537,245, Cl. 165-22.000.

Yoshimura, Isao; Hata, Hideo; and Kaneko, Takashi, to Asahi-Dow Limited. Composition for cold drawn film. 4,537,935, Cl. 525-222.000.

Yoshino, Hideo; Arai, Eisuke; and Kiuchi, Kazuhide, to Nippon Telegraph & Telephone Public Corporation. Shorted junction type programmable read only memory semiconductor devices. 4,538,167, Cl. 357-59.000.

Yoshizawa, Toyokichi: *See*—
Nozawa, Koohei; Yoshizawa, Toyokichi; and Kuroda, Toshio, 4,537,967, Cl. 546-141.000.

Young, Jorge A.; and Khandwala, Bhupendra J., to Figgie International, Inc. Card reader for time and attendance. 4,538,056, Cl. 235-377.000.

Yourd, Raymond A., III; Majumdar, Debesh; and Gruber, Robert J., to Xerox Corporation. Positively charged toner compositions containing phosphonium charge enhancing additives. 4,537,848, Cl. 430-110.000.

Yu, Ken K.: *See*—
Bohr, Mark T.; Yu, Ken K.; Yau, Leo D.; and Garg, Shyam G., 4,536,947, Cl. 29-576.00C.

Yuasa, Kazuhiro: *See*—
Komada, Kenya; Yuasa, Kazuhiro; and Kondoh, Shiroh, 4,537,491, Cl. 355-3.0DD.

Z. Bavelloni S.p.A.: *See*—
Bavelloni, Franco, 4,537,301, Cl. 198-626.000.

Zahradnik, Franz: *See*—
Schmidt, Franz; Pipper, Gunter; Floss, Josef G.; and Zahradnik, Franz, 4,537,949, Cl. 528-335.000.

Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See*—
Umezawa, Hamao; Fujii, Akio; Muraoka, Yasuhiko; Nakatani, Tokuji; Fukuoka, Takeyo; and Takahashi, Katsutoshi, 4,537,880, Cl. 514-19.000.

Zambias, Robert A.: *See*—
Chang, Michael N.; Hammond, Milton L.; Jensen, Norman P.; McDonald, John; and Zambias, Robert A., 4,537,903, Cl. 514-456.000.

Zambon S.p.A.: *See*—
Castaldi, Graziano; and Giordano, Claudio, 4,537,979, Cl. 549-347.000.

Zantinge, Jan: *See*—
van der Velde, Ype Y.; and Zantinge, Jan, 4,537,787, Cl. 426-478.000.

Zara nee Kaczian, Erzsebet: *See*—
Deak, Gyula; Zara nee Kaczian, Erzsebet; Gyorgy, Lajos; Fekete, Marton; Doda, Margit; Seregi, Andras; Kanyicska, Bela; Toth nee Pecsi, Erzsebet; Horvath nee Gaal, Maria; Manyai, Sandor; Gorgenyi, Frigyes; and Vaszovics nee Reichmann, Gyorgyi, 4,537,895, Cl. 514-307.000.

Zavecz, Terrence E.: *See*—
Banks, Edward L.; Ellington, Thomas S., IV; and Zavecz, Terrence E., 4,537,498, Cl. 355-55.000.

Zehner, Bernd, to Siemens Aktiengesellschaft. Associative memory with improved memory cell and method for operating same. 4,538,243, Cl. 365-49.000.

Zerox Corporation: *See*—
Kopko, John J., 4,537,495, Cl. 355-3.0DD.

Zeugner, Horst: *See*—
Heinemann, Henning; Jasserand, Daniel; Milkowski, Wolfgang; Yavordios, Dimitri; and Zeugner, Horst, 4,537,975, Cl. 548-359.000.

Zieff, Mark P., to Dart Industries Inc. Storage container closure. 4,537,325, Cl. 220-234.000.

Ziegler, Hans: *See*—
Parg, Adolf; Ziegler, Hans; and Wuerzer, Bruno, 4,537,621, Cl. 71-103.000.

Zimmerman, Alan R.: *See*—
Cavestany, Adrian V.; and Zimmerman, Alan R., 4,537,117, Cl. 98-39.100.

Zimmerman, John M.: *See*—
Bishop, Timothy E.; Pasternack, George; and Zimmerman, John M., 4,537,667, Cl. 204-159.150.

Zitz, Alfred; Schetina, Otto; and Wrulich, Herwig, to Voest-Alpine Aktiengesellschaft. Device for cooling the bits of cutting machine. 4,537,447, Cl. 299-1.000.

Zoetman, Herman: *See*—
Hollaar, Leendert J.; Zoetman, Herman; and Verbeek, Robert J. M., 4,538,110, Cl. 328-63.000.

Zofchak, Albert: *See*—
Fogel, Arnold W.; and Zofchak, Albert, 4,537,762, Cl. 424-70.000.

Zollinger, Max; and Jemec, Raoul, to Swiss Aluminium Ltd. Cathode pot of an aluminum reduction cell. 4,537,671, Cl. 204-243.00R.

Zondler, Helmut: *See*—
Lohse, Friedrich; and Zondler, Helmut, 4,537,946, Cl. 528-118.000.

Zuloaga, Jose M. A., to Biomasa, S.A. System for mechanically gathering trees, bushes and branches. 4,537,362, Cl. 241-101.700.

Zumbrunn, Jean-Pierre; Levielle, Jean; Thomas, Andre ; and Grangette, Francoise, to L'Air Liquide, Societe Anonyme Pour L'Etude Et L'Exploitation Des Procedes Georges Claude. Process for effecting an accelerated neutralization of cellulose textile substrates impregnated with alkaline hydroxide. 4,536,907, Cl. 8-149.100.

Zweifel, Hans: *See*—
Fischer, Walter; and Zweifel, Hans, 4,537,977, Cl. 549-243.000.

Zylstra, Henry J.; and Jansen, Harley W., to Square D Company. Ground fault desensitization circuit for electronic breaker. 4,538,194, Cl. 361-42.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 27TH DAY OF AUGUST, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Analog and Digital Systems, Inc.: *See*—
DeFreitas, Richard E., Re. 31,976, Cl. 332-11.00D.

Brownlee Labs, Inc.: *See*—
Brownlee, Robert, Re. 31,974, Cl. 210-198.200.

Brownlee, Robert, to Brownlee Labs, Inc. Cartridge type separation column and holder assembly for liquid chromatographs. Re. 31,974, Cl. 210-198.200.

Comstock, Lowell R.; and Smith, Percy L., to Union Carbide Corp. Polyester compositions. Re. 31,975, Cl. 523-514.000.

DeFreitas, Richard E., to Analog and Digital Systems, Inc. Circuitry for generating reference signal for delta encoding systems. Re. 31,976, Cl. 332-11.00D.

Ott, Granville E., to Texas Instruments Incorporated. Digital computing system having auto-incrementing memory. Re. 31,977, Cl. 364-200.000.

Smith, Percy L.: *See*—
Comstock, Lowell R.; and Smith, Percy L., Re. 31,975, Cl. 523-514.000.

Texas Instruments Incorporated: *See*—
Ott, Granville E., Re. 31,977, Cl. 364-200.000.

Union Carbide Corp.: *See*—
Comstock, Lowell R.; and Smith, Percy L., Re. 31,975, Cl. 523-514.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Bausch & Lomb Incorporated: *See*—
Yeiser, John O., B1 1,031,684, Cl. 346-68.000.

Yeiser, John O., to Bausch & Lomb Incorporated. X-Y Plotter. B1 1,031,684, 8-27-85, Cl. 346-68.000.

LIST OF DESIGN PATENTEES

Aavid Engineering, Inc.: *See*—
McCarthy, Alfred F., 280,319, Cl. D13-23.000.
McCarthy, Alfred F., 280,320, Cl. D13-23.000.

Aldrich, Thomas B., III; and Muscatiello, Ralph A., to Gillette Company, The. Bottle. 280,289, 8-27-85, Cl. D9-338.000.

Allen, James H., to 'Totes', incorporated. Combined briefcase and overnight case. 280,266, 8-27-85, Cl. D3-71.000.

Anderson, John W., Jr.; and Roche, William J., to GTE Products Corporation. Fluorescent lamp or the like. 280,344, 8-27-85, Cl. D26-3.000.

Ardito, Gerald J. Vanity mirror. 280,352, 8-27-85, Cl. D28-64.100.

Asano, Tamoru, to Kai Jirushi Hamano Center. Scissors. 280,283, 8-27-85, Cl. D8-57.000.

Aspenwall, John E. Fluorescent lamp holder. 280,346, 8-27-85, Cl. D26-75.000.

AT&T Technologies, Inc.: *See*—
Joffe, Richard M.; and McGarvey, John N., 280,325, Cl. D14-60.000.

Bachmann, Walfred R. File holder. 280,284, 8-27-85, Cl. D8-71.000.

Bakic, Dieter. Cosmetic case. 280,354, 8-27-85, Cl. D28-82.000.

Bakus, Steven L., to Felt Products Mfg. Co. Combined packaging and mixing container. 280,290, 8-27-85, Cl. D9-347.000.

Barone, Sam A. Portable electric power supply. 280,318, 8-27-85, Cl. D13-11.000.

Bausch & Lomb Incorporated: *See*—
Chuboff, David P.; Greb, Francis J.; and Markovitz, Aaron M., 280,261, Cl. D3-34.000.

Beechuk, Timothy J.; Damron, Max E.; and Vanderman, Ralph B., to Procter & Gamble Company, The. Bottle. 280,292, 8-27-85, Cl. D9-355.000.

Blaivas, Marilyn. Armband pouch. 280,255, 8-27-85, Cl. D2-383.000.

Bouman, Mark H., to Century Mfg. Co. Welding machine. 280,329, 8-27-85, Cl. D15-144.000.

Bowers, Ty S.: *See*—
Druecker, Mark T.; and Bowers, Ty S., 280,315, Cl. D12-158.000.

Boyd, Jeffrey A.; Pusateri, Vincent J.; Hooke, John; and Rockett, Danny F., to General Electric Company. Rechargable battery pack. 280,317, 8-27-85, Cl. D13-5.000.

Briggery Myles, Jacquelyn A. Swimwear. 280,252, 8-27-85, Cl. D2-40.000.

Brinkerhoff, James W.: *See*—
Scheid, William J.; Toth, Richard J.; and Brinkerhoff, James W., 280,323, Cl. D14-12.000.

Brown Jordan Company: *See*—
Criqui, Eugene A.; and Homestead, Peter W., 280,274, Cl. D6-487.000.
Criqui, Eugene A.; and Homestead, Peter W., 280,275, Cl. D6-487.000.

Brunner, Merlin A.; Robinson, David W.; and Draheim, Harvey J., to Simmons Universal Corporation. Crib footboard. 280,277, 8-27-85, Cl. D6-505.000.

Brunner, Merlin A.; Robinson, David W.; and Draheim, Harvey J., to Simmons Universal Corporation. Crib footboard. 280,278, 8-27-85, Cl. D6-508.000.

Brunner, Merlin A.; Robinson, David W.; and Draheim, Harvey J., to Simmons Universal Corporation. Crib footboard. 280,279, 8-27-85, Cl. D6-508.000.

Bryant, William C.; and Ferguson, William C., to Empire Brushes, Inc. Flexibly-backed brush. 280,267, 8-27-85, Cl. D4-130.000.

Buchet, Marcel, to L'Oreal, S.A. Single pressed powder compact. 280,353, 8-27-85, Cl. D28-78.000.

Carlisle, Floyd L., to Theratronics, Inc. Muscle stimulator. 280,341, 8-27-85, Cl. D24-36.000.

Carre, Alain: *See*—
de Mouy, Jean; and Carre, Alain, 280,295, Cl. D9-408.000.

Carry-It, Inc.: *See*—
Jackson, Kenneth W.; Simon, James; and Simon, Robert, 280,313, Cl. D12-157.000.

Carvajal Pavon, Guadalupe. Sandal. 280,254, 8-27-85, Cl. D2-283.000.

Cashmere, Raymond A., to Luckit Pty. Limited. Toboggan. 280,308, 8-27-85, Cl. D12-11.000.

Century Mfg. Co.: *See*—
Bouman, Mark H., 280,329, Cl. D15-144.000.

Chairmakers, Inc.: *See*—
Williams, David P. G., 280,269, Cl. D6-379.000.

Chuboff, David P.; Greb, Francis J.; and Markovitz, Aaron M., to Bausch & Lomb Incorporated. Carrying case for sunglasses or the like. 280,261, 8-27-85, Cl. D3-34.000.

Clairol Incorporated: *See*—
Yurdin, Carl, 280,350, Cl. D28-38.000.

Clark, James L., to Johnson Level & Tool Mfg. Co., Inc. Level vial holder. 280,302, 8-27-85, Cl. D10-74.000.
Collins, Walter W. Handle for folding pocket knife. 280,287, 8-27-85, Cl. D8-99.000.
Commodore Business Machines, Inc.: *See—*
Velinsky, Ira L., 280,322, Cl. D14-11.000.
Conti, Rino; and Daenen, Robert H. C. M., to Dart Industries Inc. Food storage container or the like. 280,281, 8-27-85, Cl. D7-79.000.
Copsey, Joan C.; McNamara, John J., Jr.; and Parker, Jeremy L., to Miles Laboratories, Inc. Bottle. 280,291, 8-27-85, Cl. D9-349.000.
Crawford Products, Inc.: *See—*
Pestone, William J., 280,280, Cl. D6-566.000.
Creamer, Joan K., to Dart Industries Inc. Reversible comb or the like. 280,349, 8-27-85, Cl. D28-29.000.
Criqui, Eugene A.; and Homestead, Peter W., to Brown Jordan Company. Table. 280,274, 8-27-85, Cl. D6-487.000.
Criqui, Eugene A.; and Homestead, Peter W., to Brown Jordan Company. Table. 280,275, 8-27-85, Cl. D6-487.000.
Daenen, Robert H. C. M.: *See—*
Conti, Rino; and Daenen, Robert H. C. M., 280,281, Cl. D7-79.000.
D'Amour, Richard; and D'Amour, Ronald. Bottle cooler. 280,293, 8-27-85, Cl. D9-373.000.
D'Amour, Ronald: *See—*
D'Amour, Richard; and D'Amour, Ronald, 280,293, Cl. D9-373.000.
Damron, Max E.: *See—*
Beechuk, Timothy J.; Damron, Max E.; and Vanderman, Ralph B., 280,292, Cl. D9-355.000.
Dart Industries Inc.: *See—*
Conti, Rino; and Daenen, Robert H. C. M., 280,281, Cl. D7-79.000.
Creamer, Joan K., 280,349, Cl. D28-29.000.
Schmidt, Janice L., 280,268, Cl. D4-136.000.
Daystar, Inc.: *See—*
Druecker, Mark T.; and Bowers, Ty S., 280,315, Cl. D12-158.000.
Del Rosso, Victor, to Hi-Speed Checkweigher Co., Inc. Powered platform scale. 280,303, 8-27-85, Cl. D10-87.000.
Del Rosso, Victor, to Hi-Speed Checkweigher Co., Inc. Powered platform scale. 280,304, 8-27-85, Cl. D10-87.000.
Del Rosso, Victor, to Hi-Speed Checkweigher Co., Inc. Powered platform scale. 280,305, 8-27-85, Cl. D10-87.000.
De Lucchi, Michele: *See—*
Sottsass, Ettore; and De Lucchi, Michele, 280,272, Cl. D6-422.000.
de Mouy, Jean; and Carre, Alain, to SOFIPAR International Inc. Flask. 280,295, 8-27-85, Cl. D9-408.000.
Drag Specialties, Inc.: *See—*
Preisler, James M.; and Stahel, Alwin J., 280,310, Cl. D12-114.000.
Draheim, Harvey J.: *See—*
Brunner, Merlin A.; Robinson, David W.; and Draheim, Harvey J., 280,277, Cl. D6-505.000.
Brunner, Merlin A.; Robinson, David W.; and Draheim, Harvey J., 280,278, Cl. D6-508.000.
Brunner, Merlin A.; Robinson, David W.; and Draheim, Harvey J., 280,279, Cl. D6-508.000.
Druecker, Mark T.; and Bowers, Ty S., to Daystar, Inc. Motorcycle luggage carrier. 280,315, 8-27-85, Cl. D12-158.000.
Dummar, Richard W. Toy transportation vehicle. 280,335, 8-27-85, Cl. D21-87.000.
Egly, Robert A.; and Sullivan, Patrick, to Egly, Robert A. Magnetic memory storage container. 280,262, 8-27-85, Cl. D3-35.000.
Empire Brushes, Inc.: *See—*
Bryant, William C.; and Ferguson, William C., 280,267, Cl. D4-130.000.
Endt, Evert, to Horlogerie Photographique Francaise. Combination telephone handset and console stand assembly. 280,324, 8-27-85, Cl. D14-53.000.
Erbach, Arthur R., to Weber-Stephen Products Co. Wire cooking rack. 280,282, 8-27-85, Cl. D7-404.000.
Ero Industries, Inc.: *See—*
Lipsig, Robert J., 280,264, Cl. D3-48.000.
Felt Products Mfg. Co.: *See—*
Bakus, Steven L., 280,290, Cl. D9-347.000.
Ferguson, William C.: *See—*
Bryant, William C.; and Ferguson, William C., 280,267, Cl. D4-130.000.
Forbes, Gloria J. Convertible jeans. 280,251, 8-27-85, Cl. D2-28.000.
Forbes, Robert C.; and VanderKam, John, to Huffy Corporation. Recumbent tricycle body. 280,309, 8-27-85, Cl. D12-112.000.
General Electric Company: *See—*
Boyd, Jeffrey A.; Pusateri, Vincent J.; Hooke, John; and Rockett, Danny F., 280,317, Cl. D13-5.000.
Gibbs, Richard B. Garment bag. 280,265, 8-27-85, Cl. D3-71.000.
Gillette Company, The: *See—*
Aldrich, Thomas B., III; and Muscatiello, Ralph A., 280,289, Cl. D9-338.000.
Goldman, Paul R. Step tube table. 280,273, 8-27-85, Cl. D6-474.000.
Gooden, David S. Anchor for small boats. 280,316, 8-27-85, Cl. D12-215.000.
Greb, Francis J.: *See—*
Chuboff, David P.; Greb, Francis J.; and Markovitz, Aaron M., 280,261, Cl. D3-34.000.
GTE Products Corporation: *See—*
Anderson, John W., Jr.; and Roche, William J., 280,344, Cl. D26-3.000.
Paget, Fredrick W., 280,345, Cl. D26-3.000.
Hafer, Carl W.; and Schwoeppe, Eric S., to Procter & Gamble Company, The. Solid product elevator cup. 280,298, 8-27-85, Cl. D9-434.000.
Halbritter, David K. Combined decal and protective cover sheet. 280,334, 8-27-85, Cl. D20-11.000.
Harwell, Betty L. Booster fan and deflector for floor vent. 280,339, 8-27-85, Cl. D23-155.000.
Hi-Speed Checkweigher Co., Inc.: *See—*
Del Rosso, Victor, 280,303, Cl. D10-87.000.
Del Rosso, Victor, 280,304, Cl. D10-87.000.
Del Rosso, Victor, 280,305, Cl. D10-87.000.
Holden, M. James, to Mobil Oil Corporation. Packaging tray. 280,296, 8-27-85, Cl. D9-425.000.
Holden, M. James, to Mobil Oil Corporation. Packaging tray. 280,297, 8-27-85, Cl. D9-425.000.
Homestead, Peter W.: *See—*
Criqui, Eugene A.; and Homestead, Peter W., 280,274, Cl. D6-487.000.
Criqui, Eugene A.; and Homestead, Peter W., 280,275, Cl. D6-487.000.
Hood, J. Vincent. Runner's hand grip. 280,337, 8-27-85, Cl. D21-198.000.
Hooke, John: *See—*
Boyd, Jeffrey A.; Pusateri, Vincent J.; Hooke, John; and Rockett, Danny F., 280,317, Cl. D13-5.000.
Horlogerie Photographique Francaise: *See—*
Endt, Evert, 280,324, Cl. D14-53.000.
Hoye, Thomas M. Beverage holder for boats. 280,263, 8-27-85, Cl. D3-40.000.
Huffy Corporation: *See—*
Forbes, Robert C.; and VanderKam, John, 280,309, Cl. D12-112.000.
Ignitor Products International, Inc.: *See—*
Miller, Benson L., 280,257, Cl. D2-400.000.
Miller, Benson L., 280,258, Cl. D2-400.000.
Jackson, Kenneth W.; Simon, James; and Simon, Robert, to Carry-It, Inc. Protective container for a vehicle jack. 280,313, 8-27-85, Cl. D12-157.000.
Joffe, Richard M.; and McGarvey, John N., to AT&T Technologies, Inc. Telephone stand for a handset. 280,325, 8-27-85, Cl. D14-60.000.
John Fluke Mfg. Co., Inc.: *See—*
Nelson, Michael D., 280,299, Cl. D10-40.000.
Johnson Level & Tool Mfg. Co., Inc.: *See—*
Clark, James L., 280,302, Cl. D10-74.000.
Jordan, James B., to Qume Corporation. Disk drive front panel. 280,326, 8-27-85, Cl. D14-115.000.
Kai Jirushi Hamano Center: *See—*
Asano, Tamoru, 280,283, Cl. D8-57.000.
Knoll International, Inc.: *See—*
Schultz, Moses R., 280,343, Cl. D25-56.000.
Kobashi, Takashi: *See—*
Nishina, Shingo; and Kobashi, Takashi, 280,301, Cl. D10-73.000.
Kohler Co.: *See—*
Kohler, Herbert V., Jr., 280,342, Cl. D24-38.000.
Kohler, Herbert V., Jr., to Kohler Co. Hydrotherapy spa or the like. 280,342, 8-27-85, Cl. D24-38.000.
Kunimune, Terry T. Automobile alarm. 280,307, 8-27-85, Cl. D10-106.000.
Leiserson, Steven G. Carrying case. 280,260, 8-27-85, Cl. D3-33.000.
Lickton, Robert J. Chain link. 280,288, 8-27-85, Cl. D8-499.000.
Lipsig, Robert J., to Ero Industries, Inc. Carryall for sleeping bag and accessories. 280,264, 8-27-85, Cl. D3-48.000.
L'Oreal, S.A.: *See—*
Buchet, Marcel, 280,353, Cl. D28-78.000.
Luckit Pty. Limited: *See—*
Cashmere, Raymond A., 280,308, Cl. D12-11.000.
Markovitz, Aaron M.: *See—*
Chuboff, David P.; Greb, Francis J.; and Markovitz, Aaron M., 280,261, Cl. D3-34.000.
Matsumoto, Hideo: *See—*
Tanaka, Yuji; and Matsumoto, Hideo, 280,330, Cl. D17-20.000.
McCarthy, Alfred F., to Aavid Engineering, Inc. Staggered-fin heat sink for electrical devices. 280,319, 8-27-85, Cl. D13-23.000.
McCarthy, Alfred F., to Aavid Engineering, Inc. Twisted-fin heat sink for electrical devices. 280,320, 8-27-85, Cl. D13-23.000.
McGarvey, John N.: *See—*
Joffe, Richard M.; and McGarvey, John N., 280,325, Cl. D14-60.000.
McKay, Stewart K. Lounge chair frame. 280,276, 8-27-85, Cl. D6-501.000.
McNamara, John J., Jr.: *See—*
Copsey, Joan C.; McNamara, John J., Jr.; and Parker, Jeremy L., 280,291, Cl. D9-349.000.
Miles Laboratories, Inc.: *See—*
Copsey, Joan C.; McNamara, John J., Jr.; and Parker, Jeremy L., 280,291, Cl. D9-349.000.
Miller, Benson L., to Ignitor Products International, Inc. Carrier for a gas torch and fuel tank. 280,257, 8-27-85, Cl. D2-400.000.
Miller, Benson L., to Ignitor Products International, Inc. Carrier for gas torch and fuel tank. 280,258, 8-27-85, Cl. D2-400.000.
Miller, Leslie D. Baton carrier for use with belt. 280,256, 8-27-85, Cl. D2-400.000.
Miller, Ronnie R.; and Rogers, Michael W. Wheel alignment tool or similar article. 280,285, 8-27-85, Cl. D8-72.000.
Mitutoyo Mfg. Co., Ltd.: *See—*
Nishina, Shingo; and Kobashi, Takashi, 280,301, Cl. D10-73.000.

Mobil Oil Corporation: *See—*
Holden, M. James, 280,296, Cl. D9-425.000.
Holden, M. James, 280,297, Cl. D9-425.000.
Motorola, Inc.: *See—*
Scheid, William J.; Toth, Richard J.; and Brinkerhoff, James W., 280,323, Cl. D14-12.000.
Moustakas, Matthew A., to Touch-On Incorporated. Lamp. 280,347, 8-27-85, Cl. D26-93.000.
Muscatiello, Ralph A.: *See—*
Aldrich, Thomas B., III; and Muscatiello, Ralph A., 280,289, Cl. D9-338.000.
Nelson, Michael D., to John Fluke Mfg. Co., Inc. Digital multimeter for electrical measurement. 280,299, 8-27-85, Cl. D10-40.000.
Newman, Susan. Rubber stamp. 280,331, 8-27-85, Cl. D18-16.000.
Nishina, Shingo; and Kobashi, Takashi, to Mitutoyo Mfg. Co., Ltd. Caliper. 280,301, 8-27-85, Cl. D10-73.000.
Okuda, Yasuhiro. Chair. 280,270, 8-27-85, Cl. D6-380.000.
Olivetti Synthesis, S.p.A.: *See—*
Sottsass, Ettore; and De Lucchi, Michele, 280,272, Cl. D6-422.000.
Paget, Fredrick W., to GTE Products Corporation. Fluorescent lamp or the like. 280,345, 8-27-85, Cl. D26-3.000.
Parker, Jeremy L.: *See—*
Copsey, Joan C.; McNamara, John J., Jr.; and Parker, Jeremy L., 280,291, Cl. D9-349.000.
Parker Pen Company, The: *See—*
Rhoades, Nolan K., 280,332, Cl. D19-84.000.
Rhoades, Nolan K., 280,333, Cl. D19-85.000.
Pawsat, Dennis P., to Wald Manufacturing Co., Inc. Bicycle handlebar mounting plate. 280,311, 8-27-85, Cl. D12-117.000.
Pestone, William J., to Crawford Products, Inc. Power tool holder. 280,280, 8-27-85, Cl. D6-566.000.
Platner, Warren. Sofa. 280,271, 8-27-85, Cl. D6-381.000.
Preisler, James M.; and Stahel, Alwin J., to Drag Specialties, Inc. Combined motorcycle trim rail and lighting unit. 280,310, 8-27-85, Cl. D12-114.000.
Procter & Gamble Company, The: *See—*
Beechuk, Timothy J.; Damron, Max E.; and Vanderman, Ralph B., 280,292, Cl. D9-355.000.
Hafer, Carl W.; and Schwoeppe, Eric S., 280,298, Cl. D9-434.000.
Pupulidy, Emanuel M. Lamp base. 280,348, 8-27-85, Cl. D26-140.000.
Pusateri, Vincent J.: *See—*
Boyd, Jeffrey A.; Pusateri, Vincent J.; Hooke, John; and Rockett, Danny F., 280,317, Cl. D13-5.000.
Qume Corporation: *See—*
Jordan, James B., 280,326, Cl. D14-115.000.
Resnick, Lynda R., to Teleflora, Inc. Perfume bottle. 280,294, 8-27-85, Cl. D9-385.000.
Rhoades, Nolan K., to Parker Pen Company, The. Desk pen base. 280,332, 8-27-85, Cl. D19-84.000.
Rhoades, Nolan K., to Parker Pen Company, The. Desk pen base. 280,333, 8-27-85, Cl. D19-85.000.
Robinson, David W.: *See—*
Brunner, Merlin A.; Robinson, David W.; and Draheim, Harvey J., 280,277, Cl. D6-505.000.
Brunner, Merlin A.; Robinson, David W.; and Draheim, Harvey J., 280,278, Cl. D6-508.000.
Brunner, Merlin A.; Robinson, David W.; and Draheim, Harvey J., 280,279, Cl. D6-508.000.
Roche, William J.: *See—*
Anderson, John W., Jr.; and Roche, William J., 280,344, Cl. D26-3.000.
Rockett, Danny F.: *See—*
Boyd, Jeffrey A.; Pusateri, Vincent J.; Hooke, John; and Rockett, Danny F., 280,317, Cl. D13-5.000.
Rogers, Michael W.: *See—*
Miller, Ronnie R.; and Rogers, Michael W., 280,285, Cl. D8-72.000.
Rumble, Clive St. J. Electrical connector. 280,321, 8-27-85, Cl. D13-24.000.
Scheid, William J.; Toth, Richard J.; and Brinkerhoff, James W., to Motorola, Inc. Microphone or similar article. 280,323, 8-27-85, Cl. D14-12.000.
Scheurer, Robert S.; and Scheurer, Stephen. Seat cushion. 280,259, 8-27-85, Cl. D6-596.000.
Scheurer, Stephen: *See—*
Scheurer, Robert S.; and Scheurer, Stephen, 280,259, Cl. D6-596.000.
Schmidt, Janice L., to Dart Industries Inc. Hairbrush or the like. 280,268, 8-27-85, Cl. D4-136.000.
Schultz, Moses R., to Knoll International, Inc. Pavilion. 280,343, 8-27-85, Cl. D25-56.000.
Schwoeppe, Eric S.: *See—*
Hafer, Carl W.; and Schwoeppe, Eric S., 280,298, Cl. D9-434.000.
Shay, Weldon. Manicure instrument. 280,351, 8-27-85, Cl. D28-57.000.
Short, Bernard. Measuring device for children's feet. 280,300, 8-27-85, Cl. D10-71.000.
Simeri, Albert R.; and Simeri, Paul S., to Van Express, Inc. Overhead console for a van. 280,312, 8-27-85, Cl. D12-155.000.
Simeri, Paul S.: *See—*
Simeri, Albert R.; and Simeri, Paul S., 280,312, Cl. D12-155.000.
Simmons Universal Corporation: *See—*
Brunner, Merlin A.; Robinson, David W.; and Draheim, Harvey J., 280,277, Cl. D6-505.000.
Brunner, Merlin A.; Robinson, David W.; and Draheim, Harvey J., 280,278, Cl. D6-508.000.
Brunner, Merlin A.; Robinson, David W.; and Draheim, Harvey J., 280,279, Cl. D6-508.000.
Simon, James: *See—*
Jackson, Kenneth W.; Simon, James; and Simon, Robert, 280,313, Cl. D12-157.000.
Simon, Robert: *See—*
Jackson, Kenneth W.; Simon, James; and Simon, Robert, 280,313, Cl. D12-157.000.
Skarsten, Stephen R., to Skilten Electronics Limited. Hot air blower. 280,338, 8-27-85, Cl. D23-77.000.
Skilten Electronics Limited: *See—*
Skarsten, Stephen R., 280,338, Cl. D23-77.000.
Smilgys, Bruno S., to Veeder Industries Inc. Counter wheel indicia rim. 280,306, 8-27-85, Cl. D10-103.000.
SOFIPAR International Inc.: *See—*
de Mouy, Jean; and Carre, Alain, 280,295, Cl. D9-408.000.
Sottsass, Ettore; and De Lucchi, Michele, to Olivetti Synthesis, S.p.A. Desks. 280,272, 8-27-85, Cl. D6-422.000.
Sports Marketing, Inc.: *See—*
Vacanti, Eugene J., 280,250, Cl. D2-27.000.
Stahel, Alwin J.: *See—*
Preisler, James M.; and Stahel, Alwin J., 280,310, Cl. D12-114.000.
Strongwater, Murray. Steering wheel cover. 280,314, 8-27-85, Cl. D12-177.000.
Sullivan, Patrick: *See—*
Egly, Robert A.; and Sullivan, Patrick, 280,262, Cl. D3-35.000.
Tanaka, Yuji; and Matsumoto, Hideo, to Tokai Gakki Co., Ltd. Electric guitar string locking device. 280,330, 8-27-85, Cl. D17-20.000.
Teleflora, Inc.: *See—*
Resnick, Lynda R., 280,294, Cl. D9-385.000.
Terumo Corporation: *See—*
Wada, Masaru, 280,340, Cl. D24-8.000.
Theratronics, Inc.: *See—*
Carlisle, Floyd L., 280,341, Cl. D24-36.000.
Tokai Gakki Co., Ltd.: *See—*
Tanaka, Yuji; and Matsumoto, Hideo, 280,330, Cl. D17-20.000.
'Totes', incorporated: *See—*
Allen, James H., 280,266, Cl. D3-71.000.
Toth, Richard J.: *See—*
Scheid, William J.; Toth, Richard J.; and Brinkerhoff, James W., 280,323, Cl. D14-12.000.
Touch-On Incorporated: *See—*
Moustakas, Matthew A., 280,347, Cl. D26-93.000.
U.S. Philips Corporation: *See—*
Van Asten, Jan F., 280,286, Cl. D8-93.000.
Vacanti, Eugene J., to Sports Marketing, Inc. Thigh protector. 280,250, 8-27-85, Cl. D2-27.000.
Van Express, Inc.: *See—*
Simeri, Albert R.; and Simeri, Paul S., 280,312, Cl. D12-155.000.
Van Asten, Jan F., to U.S. Philips Corporation. Knife sharpener. 280,286, 8-27-85, Cl. D8-93.000.
VanderKam, John: *See—*
Forbes, Robert C.; and VanderKam, John, 280,309, Cl. D12-112.000.
Vanderman, Ralph B.: *See—*
Beechuk, Timothy J.; Damron, Max E.; and Vanderman, Ralph B., 280,292, Cl. D9-355.000.
Veeder Industries Inc.: *See—*
Smilgys, Bruno S., 280,306, Cl. D10-103.000.
Velinsky, Ira L., to Commodore Business Machines, Inc. Videogame cartridge case. 280,322, 8-27-85, Cl. D14-11.000.
Wada, Masaru, to Terumo Corporation. Artificial lung with a built-in heat exchanger. 280,340, 8-27-85, Cl. D24-8.000.
Wald Manufacturing Co., Inc.: *See—*
Pawsat, Dennis P., 280,311, Cl. D12-117.000.
Waste Compaction Systems, Inc.: *See—*
Wilson, Robert A., 280,327, Cl. D15-123.000.
Webb, David. Arm exercising attachment for an exercising bicycle. 280,336, 8-27-85, Cl. D21-191.000.
Weber-Stephen Products Co.: *See—*
Erbach, Arthur R., 280,282, Cl. D7-404.000.
Williams, Cal R. Male formal-wear coat. 280,253, 8-27-85, Cl. D2-187.000.
Williams, David P. G., to Chairmakers, Inc. Sofa. 280,269, 8-27-85, Cl. D6-379.000.
Wilson, Robert A., to Waste Compaction Systems, Inc. Material compactor. 280,327, 8-27-85, Cl. D15-123.000.
Yurdin, Carl, to Clairol Incorporated. Hairsetter. 280,350, 8-27-85, Cl. D28-38.000.
Zampini, Louis, Jr. Housing for sanders, grinders or the like. 280,328, 8-27-85, Cl. D15-124.000.

LIST OF PLANT PATENTEES

B. V. Handelskwekerij, M.C. van Staaveren: *See*—
van Andel, Jacob, 5,542, Cl. 68.000.
van Andel, Jacob, 5,544, Cl. 70.000.

Ellison, J. Howard; and Kinelski, John J., to Rutgers University. Asparagus plant-female plant No. 53 Inez. 5,546, 8-27-85, Cl. 89.000.

Fischer, Arnold, to Pan American Plant Company. African Violet plant named Marguerite. 5,543, 8-27-85, Cl. 69.000.

Hilverda B.V.: *See*—
Hilverda, Jan J., 5,545, Cl. 71.000.

Hilverda, Jan J., to Hilverda B.V. Carnation named Hilkari. 5,545, 8-27-85, Cl. 71.000.

Kinelski, John J.: *See*—
Ellison, J. Howard; and Kinelski, John J., 5,546, Cl. 89.000.

Pan American Plant Company: *See*—
Fischer, Arnold, 5,543, Cl. 69.000.

Rutgers University: *See*—
Ellison, J. Howard; and Kinelski, John J., 5,546, Cl. 89.000.

van Andel, Jacob, to B. V. Handelskwekerij, M.C. van Staaveren. Alstroemeria named Staltang. 5,542, 8-27-85, Cl. 68.000.

van Andel, Jacob, to B. V. Handelskwekerij M. C. van Staaveren. Carnation named Stanquin. 5,544, 8-27-85, Cl. 70.000.

CLASSIFICATION OF PATENTS

ISSUED AUGUST 27, 1985

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

160 4,536,889
164 4,536,890
409 4,536,891
424 4,536,892

CLASS 4

233 4,536,899
324 4,536,900
416 4,536,901
476 4,536,902

CLASS 5

61 4,536,903
201 4,536,904
434 4,536,905
468 4,536,906

CLASS 8

94.1 R 4,537,594
115.6 4,537,595
4,537,596
149.1 4,536,907
639 4,537,597
641 4,537,598

CLASS 15

1.7 4,536,908
4 4,536,909
104 S 4,536,910
230.12 4,536,911
230.17 4,536,912
257 R 4,536,913
344 4,536,914
345 4,536,915

CLASS 16

48.5 4,536,916
288 4,536,917
308 4,536,918

CLASS 17

11 4,536,919
46 4,536,920

CLASS 24

132 WL 4,536,921
265 B 4,536,922
433 4,536,923
487 4,536,924
511 4,536,925
523 4,536,926

CLASS 28

110 4,536,927

CLASS 29

1.2 4,536,928
33 K 4,536,929
4,536,930
90 R 4,536,931
156.8 B 4,536,932
235 4,536,933
278 4,536,934
281.1 4,536,935
447 4,536,936
460 4,536,937
527.5 4,536,938
566.4 4,536,939
569 L 4,536,940
571 4,536,941
4,536,942
4,536,943
4,536,944
4,536,945
4,536,946
576 C 4,536,947
577 C 4,536,948
578 4,536,949
4,536,950
589 4,536,951
596 4,536,952
622 4,536,953
736 4,536,954
840 4,536,955

CLASS 30

43.92 4,536,956
90.4 4,536,957
120.3 4,536,958
161 4,536,959

CLASS 33

143 M 4,536,960
169 R 4,536,961
178 E 4,536,963
199 R 4,536,964
233 4,536,965
257 4,536,966
366 4,536,967
367 4,536,968
516 4,536,962

CLASS 34

9 4,536,969
41 4,536,970
89 4,536,971
92 4,536,972
182 4,536,973

CLASS 36

28 4,536,974
136 4,536,975

CLASS 37

117.5 4,536,976

CLASS 38

77.83 4,536,977
103 4,536,978

CLASS 40

159 4,536,979
427 4,536,980

CLASS 42

69 B 4,536,981
71 R 4,536,982
90 4,536,983

CLASS 43

17.2 4,536,984
17.6 4,536,985
42.27 4,536,986
42.34 4,536,987

CLASS 44

1 SR 4,537,599
51 4,537,600
62 4,537,601
4,537,602

CLASS 47

1.5 4,536,988
46 4,536,989

CLASS 48

197 R 4,537,603

CLASS 49

501 4,536,990

CLASS 51

101 R 4,536,991
109 R 4,536,992
165.8 4,536,993
298 4,537,604
328 4,536,994

CLASS 52

27 4,536,995
67 4,536,996
86 4,536,997
171 4,536,998
208 4,536,999
235 4,537,000
311 4,537,001
403 4,537,002
573 4,537,003
788 4,537,004

CLASS 53

131 4,537,005
134 4,537,006
386 4,537,015
425 4,537,007
438 4,537,008
441 4,537,009
447 4,537,010
493 4,537,016
509 4,537,011
515 4,537,017
552 4,537,012
570 4,537,013
4,537,014

CLASS 55

48 4,537,605
158 4,537,606
163 4,537,607
337 4,537,608

CLASS 57

90 4,537,018
202 4,537,019
263 4,537,020
401 4,537,021
4,537,022

CLASS 60

39.05 4,537,023
39.161 4,537,024
39.281 4,537,025
264 4,537,026
272 4,537,028
323 4,537,027
390 4,537,029
641.7 4,537,030
649 4,537,031
662 4,537,032

CLASS 62

3 4,537,033
62 4,537,034
89 4,537,035
116 4,537,036
4,537,037
118 4,537,038
182 4,537,039
186 4,537,040
199 4,537,041
208 4,537,042
239 4,537,043
371 4,537,044
503 4,537,045
505 4,537,046
510 4,537,047

CLASS 65

1 4,537,609
3.44 4,537,610
18.2 4,537,611
30.11 4,537,612

CLASS 66

93 4,537,048

CLASS 70

277 4,537,049

CLASS 71

5 4,537,613
28 4,537,614
36 4,537,615
90 4,537,623
92 4,537,616
4,537,617
4,537,618
93 4,537,619
94 4,537,620
103 4,537,621
108 4,537,622

CLASS 72

8 4,537,050
12 4,537,051
154 4,537,052
157 4,537,053
224 4,537,054
235 4,537,055
238 4,537,056
243 4,537,057

CLASS 73

1 G 4,537,058
7 4,537,059
12 4,537,060
38 4,537,062
4,537,063
54 4,537,064
117.3 4,537,065
117.4 4,537,066
151 4,537,067
202 4,537,068
290 R 4,537,061
313 4,537,070
432 R 4,537,069
4,537,071
4,537,072
589 4,537,630
602 4,537,073
625 4,537,074
634 4,537,075
662 4,537,076
665 4,537,077
744 4,537,078
747 4,537,079
794 4,537,082
857 4,537,080
861.77 4,537,081

CLASS 74

89.15 4,537,083
89.22 4,537,084
99 A 4,537,085
201 4,537,086
394 4,537,087
473 SW 4,537,088
493 4,537,089
502 4,537,090
572 4,537,091
695 4,537,092
798 4,537,093
804 4,537,094
868 4,537,095

CLASS 75

0.5 A 4,537,625
0.5 B 4,537,624
35 4,537,626
76 4,537,627
118 R 4,537,628
130 R 4,537,629

CLASS 76

1 4,537,096
108 A 4,537,097

CLASS 81

177.85 4,537,100
180.1 4,537,101
488 4,537,098

CLASS 83

16 4,537,102
174 4,537,103
348 4,537,104
471.3 4,537,105
650 4,537,106
694 4,537,107

CLASS 84

1.01 4,537,108
1.03 4,537,109
1.26 4,537,110
473 4,537,111

CLASS 86

37 4,537,112

CLASS 92

24 4,537,113

CLASS 98

2.06 4,537,114
2.18 4,537,115
36 4,537,116
39.1 4,537,117
40.01 4,537,118
52 4,537,119
115.2 4,537,120

CLASS 99

450.4 4,537,121
516 4,537,122

CLASS 100

125 4,537,123

CLASS 101

28 4,537,124
93.04 4,537,125
123 4,537,126
141 4,537,127
407 BP 4,537,128
415.1 4,537,129
425 4,537,130

CLASS 102

217 4,537,131
307 4,537,132
316 4,537,133
380 4,537,134

CLASS 104

12 4,537,135
138 G 4,537,136

CLASS 105

26 R 4,537,137
168 4,537,138

CLASS 106

14.12 4,537,632
22 4,537,631
96 4,537,633
214 4,537,634
277 4,537,635
291 4,537,636

CLASS 110

276 4,537,139
281 4,537,140
300 4,537,141

CLASS 112

231 4,537,142

CLASS 114

39 4,537,143
61 4,537,144
91 4,537,145
103 4,537,146
201 R 4,537,147

CLASS 119

1 4,537,148
4 4,537,149
14.17 4,537,150
14.54 4,537,152
20 4,537,151
95 4,537,153
96 4,537,154
109 4,537,155

CLASS 122

6 A 4,537,156
412 4,537,157

CLASS 123

41.1 4,537,158
41.27 4,537,159
41.58 4,537,160
41.71 4,537,161
43 R 4,537,162
52 MC 4,537,163
90.16 4,537,164
4,537,165
90.36 4,537,166
193 C 4,537,167
198 R 4,537,168
325 4,537,169
449 4,537,170
4,537,171
527 4,537,172
592 4,537,173
604 4,537,174
649 4,537,175

CLASS 124

62 4,537,176

CLASS 125

13 R 4,537,177

CLASS 126

110 R 4,537,178
415 4,537,179
437 4,537,180

CLASS 127

60 4,537,637

CLASS 128

1.3 4,537,181
4 4,537,182
79 4,537,183
90 4,537,184
92 B 4,537,185
130 4,537,186
151 4,537,187
200.21 4,537,188
202.13 4,537,189
204.22 4,537,190
205.13 4,537,191
207.17 4,537,192
303.1 4,537,193
399 4,537,194
422 4,537,195
630 4,537,196
633 4,537,197
639 4,537,198
660 4,537,199
696 4,537,200
697 4,537,201
712 4,537,202
734 4,537,203

CLASS 131

274 4,537,204
280 4,537,205
281 4,537,206

CLASS 132

76.4 4,537,207

CLASS 134

2 4,537,638
10 4,537,639
18 4,537,640
124 4,537,208
166 C 4,537,209

CLASS 135

87 4,537,210

CLASS 137

1 4,537,211
2 4,537,212
269.5 4,537,213
318 4,537,214
355.26 4,537,215
514 4,537,216
561 A 4,537,217
596.13 4,537,218
614.19 4,537,219
625.64 4,537,220
637.2 4,537,221

CLASS 138

130 4,537,222
139 4,537,223
4,537,224
145 4,537,225

CLASS 139

100 4,537,226
420 R 4,537,227
453 4,537,228

CLASS 141

83 4,537,229
146 4,537,230
238 4,537,231
382 4,537,232
387 4,537,233

CLASS 144

134 A 4,537,234
193 C 4,537,235
336 4,537,236

CLASS 148

11.5 P 4,537,641
11.5 Q 4,537,642
12 R 4,537,643
36 4,537,644

CLASS 149

3 4,537,645

CLASS 156

212 4,537,646
245 4,537,647
351 4,537,648
355 4,537,649
384 4,537,650
613 4,537,651
617 SP 4,537,652
620 4,537,653
644 4,537,654

CLASS 160

201 4,537,237

CLASS 162

23 4,537,655
38 4,537,656
164.3 4,537,657
348 4,537,658
352 4,537,659

CLASS 164

169 4,537,238
423 4,537,239
430 4,537,240
442 4,537,241

460 4,537,242
481 4,537,243

CLASS 165

1 4,537,244
22 4,537,245
80 B 4,537,246
104.14 4,537,247
113 4,537,248
134 R 4,537,249

CLASS 166

55 4,537,250
196 4,537,251
245 4,537,252
274 4,537,253
278 4,537,254
297 4,537,255
299 4,537,256
369 4,537,257
374 4,537,258

CLASS 172

4.5 4,537,259
9 4,537,260
44 4,537,261
146 4,537,262

CLASS 173

1 4,537,263
48 4,537,264

CLASS 174

6 4,538,019
52 S 4,538,025
65 R 4,538,020
92 4,538,021
113 R 4,538,022
115 4,538,023
117 F 4,538,024

CLASS 175

19 4,537,265

CLASS 177

208 4,537,266

CLASS 178

2 R 4,538,026
22.01 4,538,027

CLASS 179

2 EA 4,538,028
4,538,029
7.1 TP 4,538,030
81 B 4,538,031
170 D 4,538,032
175 4,538,033
182 R 4,538,034

CLASS 180

9.1 4,537,267
4,537,268
10 4,537,269
70.1 4,537,270
131 4,537,271
176 4,537,272
229 4,537,273
270 4,537,274
300 4,537,275

CLASS 181

21 4,537,276
214 4,537,277
227 4,537,278
241 4,537,279
243 4,537,280

CLASS 182

2 4,537,281
46 4,537,282
127 4,537,283

CLASS 184

7.4 4,537,284
15.2 4,537,285

CLASS 187

1 A 4,537,286
29 R 4,537,287

CLASS 188

71.8 4,537,288
73.31 4,537,290
73.38 4,537,291
73.39 4,537,292
97.4 4,537,289
196 BA 4,537,293

CLASS 192

98 4,537,294
106.2 4,537,295
4,537,296
4,537,297
4,537,298
107 C 4,537,299

CLASS 198

453 4,537,300
626 4,537,301
4,537,302

CLASS 200

6 A 4,538,035
11 EA 4,538,036
38 R 4,538,037
61.71 4,538,038
144 B 4,538,039
159 A 4,538,040

CLASS 202

170 4,537,660

CLASS 204

1 R 4,537,662
1 T 4,537,661
14.1 4,537,663
28 4,537,664
29 4,537,665
129.95 4,537,666
159.15 4,537,667
159.17 4,537,668
201 4,537,669
224 R 4,537,670
243 R 4,537,671
253 4,537,672
4,537,673
290 R 4,537,674

CLASS 206

219 4,537,303
335 4,537,304
438 4,537,305
455 4,537,306
4,537,307
484 4,537,308
525 4,537,309
526 4,537,310
529 4,537,311
531 4,537,312
545 4,537,313

CLASS 208

8 LE 4,537,675
251 R 4,537,676
370 4,537,677

CLASS 209

211 4,537,314

CLASS 210

150 4,537,678
194 4,537,679
198.2 Re.31,974
316 4,537,680
317 4,537,681
611 4,537,682
667 4,537,683
696 4,537,684
709 4,537,685
713 4,537,686
793 4,537,687

CLASS 211

70.6 4,537,315
133 4,537,316

CLASS 212

189 4,537,317

CLASS 215

232 4,537,318
252 4,537,319
276 4,537,320

CLASS 219

10.75 4,538,041
58 4,538,042
69 V 4,538,043
80 4,538,044
91.21 4,538,045
125.1 4,538,046
4,538,047
137 R 4,538,048
386 4,538,049
388 4,538,050
466 4,538,051
469 4,538,052
541 4,538,053
545 4,538,054

CLASS 220

2.1 A 4,537,321
4,537,322
2.1 R 4,537,323
90.2 4,537,324
234 4,537,325
269 4,537,326
359 4,537,327
445 4,537,328
465 4,537,329

CLASS 221

26 4,537,330

CLASS 222

165 4,537,331
190 4,537,332
345 4,537,333
401 4,537,334
496 4,537,335
641 4,537,336

CLASS 223

114 4,537,337

CLASS 224

39 4,537,338
188 4,537,339
202 4,537,340
4,537,341

CLASS 225

93 4,537,099

CLASS 227

78 4,537,342
120 4,537,343

CLASS 229

34 R 4,537,344

CLASS 235

70 R 4,538,055
377 4,538,056
379 4,538,057
380 4,538,058
468 4,538,059
472 4,538,060

CLASS 236

11 4,537,345
34.5 4,537,346
49 4,537,347

CLASS 237

8 A 4,537,348
12.3 C 4,537,349

CLASS 239

25 4,537,350
43 4,537,351
90 4,537,352
102 4,537,353
4,537,354
119 4,537,355
230 4,537,356
290 4,537,357
413 4,537,358
533.6 4,537,359
553.3 4,537,360

CLASS 241

81 4,537,361
101.7 4,537,362

CLASS 242

58.6 4,537,368
86.51 4,537,364
107.4 A 4,537,363
107.6 4,537,365
137 4,537,366
198 4,537,367

CLASS 244

1 R 4,537,369
3.16 4,537,370
3.22 4,537,371
12.4 4,537,372
22 4,537,373
102 R 4,537,374
171 4,537,375

CLASS 248

97 4,537,376
99 4,537,377
163.1 4,537,378
222.2 4,537,379
460 4,537,380
559 4,537,381
568 4,537,382

CLASS 250

201 4,538,061
4,538,062
214 R 4,538,063
231 R 4,538,064
310 4,538,065
374 4,538,066
396 R 4,538,067
443.1 4,538,068
491.1 4,538,069
504 R 4,538,070
505.1 4,538,071
568 4,538,072

CLASS 251

58 4,537,383
83 4,537,384
214 4,537,385
302 4,537,386
331 4,537,387

CLASS 252

8.5 M 4,537,688
11 4,537,689
48.4 4,537,690
49.6 4,537,691
4,537,692
51.5 A 4,537,694
51.5 R 4,537,693
52 R 4,537,920
70 4,537,695
75 4,537,696
90 4,537,697
299.61 4,537,698
313.2 4,537,699
315.1 4,537,700
344 4,537,701
518 4,537,703
522 R 4,537,702
4,537,704
529 4,537,705
545 4,537,706
4,537,707
554 4,537,708
558 4,537,709
628 4,537,710
633 4,537,711

CLASS 254

232 4,537,388

CLASS 260

112 R 4,537,712
112.5 R 4,537,713
4,537,714
4,537,715
4,537,717
4,537,718
112.5 T 4,537,716
239 A 4,537,719
4,537,720
242.2 4,537,721
397.4 4,537,722
400 4,537,723
4,537,724
453 P 4,537,726
455 R 4,537,727
4,537,728
944 4,537,729
989 4,537,730

CLASS 261

94 4,537,731

CLASS 264

1.1 4,537,732
9 4,537,733
22 4,537,734
40.4 4,537,737
63 4,537,735
130 4,537,736
210.5 4,537,738
247 4,537,739

CLASS 269

34 4,537,389

CLASS 270

53 4,537,390

CLASS 271

101 4,537,391

CLASS 272

85 4,537,392
94 4,537,393
117 4,537,394
123 4,537,395
130 4,537,396

CLASS 273

55 B 4,537,397
67 A 4,537,398
75 4,537,399
4,537,400
112 4,537,401
116 4,537,402
164 4,537,403
422 4,537,404
428 4,537,405

CLASS 277

1 4,537,406
2 4,537,407
34 4,537,408
83 4,537,409

CLASS 279

4 4,537,410

CLASS 280

6 R 4,537,411
7.12 4,537,412
33.99 B 4,537,413
47.41 4,537,414
242 WC 4,537,415
478 R 4,537,416
602 4,537,417
605 4,537,418
607 4,537,419
654 4,537,421
661 4,537,420
705 4,537,422
759 4,537,423

CLASS 285

7 4,537,424
55 4,537,425
110 4,537,426
305 4,537,427
333 4,537,428
334 4,537,429
364 4,537,430

CLASS 292

216 4,537,431
318 4,537,432

CLASS 294

58 4,537,433
82.31 4,537,434
86.1 4,537,435
150 4,537,436

CLASS 296

1 C 4,537,437
17 4,537,438
37.9 4,537,439
108 4,537,440
181 4,537,441
221 4,537,442

CLASS 297

159 4,537,443
284 4,537,444
300 4,537,445
464 4,537,446

CLASS 299

1 4,537,447
81 4,537,448

CLASS 301

9 CN 4,537,449

CLASS 307

33 4,538,073
126 4,538,074
454 4,538,075
475 4,538,076
476 4,538,077
592 4,538,078

CLASS 308

3.8 4,537,450

CLASS 310

74 4,538,079
90 4,538,081
152 4,538,082
154 4,538,080
198 4,538,083
217 4,538,084
239 4,538,085
258 4,538,086
332 4,538,087

CLASS 312

6 4,537,451
314 4,537,452

CLASS 313

325 4,538,088
478 4,538,089
578 4,538,090
625 4,538,091

CLASS 315

58 4,538,092
219 4,538,093
221 4,538,094
244 4,538,095

CLASS 318

314 4,538,096
490 4,538,097
567 4,538,098
678 4,538,099
808 4,538,100

CLASS 323

272 4,538,101
349 4,538,102

CLASS 324

52 4,538,103
158 F 4,538,104
158 R 4,538,105
158 T 4,538,106
206 4,538,107
232 4,538,108
338 4,538,109

CLASS 328

63 4,538,110

CLASS 329

122 4,538,111
145 4,538,112

CLASS 330

126 4,538,113
253 4,538,114
4,538,115
271 4,538,116
277 4,538,117
286 4,538,118

CLASS 331

1 A 4,538,119
12 4,538,120
25 4,538,121
96 4,538,122

CLASS 332

11 D Re.31,976

CLASS 333

208 4,538,123
246 4,538,124
248 4,538,125

CLASS 335

78 4,538,126
210 4,538,127
4,538,128
230 4,538,129
306 4,538,130

CLASS 336

7.1 4,537,957
57 4,538,131
221 4,538,132

CLASS 337

4 4,538,133
113 4,538,134

CLASS 339

33 4,537,453
45 M 4,537,454
99 R 4,537,455
4,537,456
117 P 4,537,457
143 R 4,537,458
4,537,459
235 4,537,460
258 R 4,537,461
259 R 4,537,462
276 A 4,537,463

CLASS 340

63 4,538,135
310 R 4,538,136
512 4,538,137
521 4,538,138
539 4,538,139
556 4,538,140
604 4,538,141
667 4,538,142
719 4,538,143
747 4,538,144
805 4,538,145
814 4,538,146
825.05 4,538,147

CLASS 343

5 VQ 4,538,152
17.2 R 4,538,148
4,538,149
17.7 4,538,150
18 A 4,538,151
700 MS 4,538,153
705 4,538,154
715 4,538,155

CLASS 346

21 4,538,156
68 B1 Re.31,684
75 4,538,157
135.1 4,538,158
4,538,159
140 R 4,538,160
4,538,161
155 4,538,162
4,538,163
209 4,538,164

CLASS 350

1.4 4,537,464
68 4,537,465
96.20 4,537,466
4,537,467
96.21 4,537,468
96.24 4,537,469
317 4,537,470
333 4,537,471
414 4,537,472
432 4,537,473
4,537,474
448 4,537,475
461 4,537,476
507 4,537,477
611 4,537,478

CLASS 351

169 4,537,479
235 4,537,480

CLASS 352

89 4,537,481
186 4,537,482

CLASS 353

39 4,537,483

CLASS 354

62 4,537,484
304 4,537,485
317 4,537,486
400 4,537,487
402 4,537,488
403 4,537,489

CLASS 355

3 DD 4,537,491
4,537,494
4,537,495
3 FU 4,537,492
3 R 4,537,490
3 SH 4,537,493
10 4,537,496
14 R 4,537,497
55 4,537,498
58 4,537,499
67 4,537,500
76 4,537,501

CLASS 356

5 4,537,502
28.5 4,537,503
71 4,537,504
237 4,537,505
312 4,537,506
336 4,537,507
346 4,537,508
399 4,537,509
435 4,537,510

CLASS 357

22 4,538,165
23.6 4,538,166
59 4,538,167
72 4,538,168
76 4,538,169
80 4,538,170
81 4,538,171

CLASS 358

13 4,538,172
75 4,538,173
86 4,538,174
4,538,175
4,538,176
101 4,538,177
166 4,538,178
4,538,179
186 4,538,180
208 4,538,181
280 4,538,182
4,538,183
283 4,538,184
285 4,538,185
298 4,538,186
330 4,538,187

CLASS 360

14.3 4,538,188
40 4,538,189
73 4,538,190
88 4,538,191
98 4,538,192
137 4,538,193

CLASS 361

42 4,538,194
64 4,538,195
4,538,196
71 4,538,197
86 4,538,198
93 4,538,199
117 4,538,200
124 4,538,201
4,538,202
159 4,538,203
229 4,538,204
308 4,538,205
315 4,538,206
317 4,538,207
319 4,538,208
395 4,538,209
401 4,538,210
415 4,538,211
433 4,538,212

CLASS 362

61 4,538,213
147 4,538,214
282 4,538,215
311 4,538,216
375 4,538,217
802 4,538,218

CLASS 363

26 4,538,219
161 4,538,220

CLASS 364

172 4,538,221
4,538,222
200 Re.31,977
4,538,223
4,538,224
4,538,225
4,538,226
414 4,538,227
426 4,538,228
428 4,538,229
433 4,538,230
483 4,538,231
491 4,538,232
513 4,538,233
513.5 4,538,234
569 4,538,235
574 4,538,236
746 4,538,237
4,538,238
754 4,538,240
759 4,538,239
900 4,538,241

CLASS 365

8 4,538,242
49 4,538,243
155 4,538,244
200 4,538,245
226 4,538,246
230 4,538,247

CLASS 366

127 4,537,511
132 4,537,512
162 4,537,513

CLASS 367

25 4,538,248
94 4,538,249
154 4,538,250
4,538,251

CLASS 368

107 4,537,514
202 4,537,515

CLASS 369

13 4,538,252
34 4,538,253
43 4,538,254
51 4,538,255
88 4,538,256
106 4,538,257
271 4,538,258

CLASS 370

60 4,538,259
66 4,538,260
85 4,538,261
4,538,262
86 4,538,263

CLASS 371

8 4,538,264
12 4,538,265
15 4,538,266
20 4,538,267
4,538,268
22 4,538,269
37 4,538,270
49 4,538,271
61 4,538,272
62 4,538,273

CLASS 372

3 4,536,274
4 4,538,275
26 4,538,276
33 4,538,277
70 4,538,278

CLASS 373

139 4,538,279

CLASS 374

1 4,537,516
21 4,537,517
188 4,537,518

CLASS 375

1 4,538,280
2.2 4,538,281
9 4,538,282
14 4,538,283
39 4,538,284
104 4,538,285
112 4,538,286

CLASS 376

256 4,537,740
261 4,537,741

CLASS 377

60 4,538,287
76 4,538,288

CLASS 378

20 4,538,289
44 4,538,290
119 4,538,291
169 4,538,292
181 4,538,293
187 4,538,294

CLASS 381

43 4,538,295
72 4,538,296
94 4,538,297
98 4,538,298

CLASS 382

21 4,538,299

CLASS 384

478 4,537,519

CLASS 400

124 4,537,520
637.6 4,537,521

CLASS 401

218 4,537,522

CLASS 403

12 4,537,523
140 4,537,524
191 4,537,525
370 4,537,526

CLASS 405

50 4,537,527
72 4,537,528
125 4,537,529
160 4,537,530
174 4,537,531
217 4,537,532
227 4,537,533
252 4,537,534
260 4,537,535
267 4,537,536

CLASS 409

34 4,537,537
217 4,537,538

CLASS 410

77 4,537,539
82 4,537,540

CLASS 411

55 4,537,541
4,537,542
371 4,537,543

CLASS 412

5 4,537,544
7 4,537,545
10 4,537,546

CLASS 414

5 4,537,547
24.5 4,537,548
4,537,549
46 4,537,550
199 4,537,551
222 4,537,552
302 4,537,553
328 4,537,554
463 4,537,555
725 4,537,556
735 4,537,557

CLASS 415

1 4,537,558

CLASS 416

119 4,537,559
198 A 4,537,560

CLASS 417

63 4,537,561
215 4,537,562
226 4,537,563
313 4,537,564
413 4,537,565
569 4,537,566

CLASS 418

63 4,537,567
202 4,537,568

CLASS 419

8 4,537,742
38 4,537,743

CLASS 420

446 4,537,744
590 4,537,745

CLASS 422

28 4,537,746
100 4,537,747
122 4,537,748
304 4,537,749

CLASS 423

65 4,537,750
114 4,537,751
224 4,537,752
228 4,537,753
277 4,537,754
300 4,537,755
323 4,537,756
328 4,537,757
329 4,537,758
349 4,537,759
359 4,537,760
502 4,537,835
644 4,537,761

CLASS 424

49 4,537,763
50 4,537,764
53 4,537,765
4,537,778
63 4,537,766
70 4,537,767
78 4,537,768
89 4,537,769
4,537,770
118 4,537,771
154 4,537,774
195.1

CLASS 425

405 H 4,537,569
450.1 4,537,570

CLASS 426

243 4,537,783
303 4,537,784
332 4,537,785
438 4,537,786
478 4,537,787
614 4,537,788
634 4,537,789

CLASS 427

2 4,537,790
4,537,791
13 4,537,792
35 4,537,793
37 4,537,794
39 4,537,795
54.1 4,537,805
118 4,537,804
136 4,537,796
150 4,537,797
166 4,537,798
259 4,537,799
327 4,537,800
356 4,537,801
368 4,537,802
385.5 4,537,803

CLASS 428

7 4,537,806
36 4,537,808
41 4,537,809
74 4,537,807
121 4,537,821
156 4,537,810
166 4,537,811
182 4,537,812
209 4,537,813
212 4,537,822
216 4,537,832
217 4,537,814
219 4,537,815
234 4,537,816
260 4,537,817
262 4,537,818
284 4,537,819
285 4,537,820
308.4 4,537,823
323 4,537,824
327 4,537,825
328 4,537,826
4,537,833
409 4,537,827
412 4,537,828
413 4,537,834
429 4,537,829
437 4,537,830
514 4,537,831
522 4,537,836
621 4,537,837

CLASS 429

9 4,537,838
20 4,537,839
33 4,537,840
56 4,537,841
140 4,537,842
197 4,537,843

CLASS 430

58 4,537,844
4,537,845
4,537,846
4,537,847
85 4,537,849
110 4,537,848
137 4,537,850
144 4,537,851
218 4,537,853
283 4,537,854
285 4,537,855
372 4,537,856
549 4,537,857

CLASS 432

27 4,537,571
55 4,537,572

CLASS 433

32 4,537,573
69 4,537,574
176 4,537,575

CLASS 434

404 4,537,576

CLASS 435

119 4,537,858
146 4,537,859
215 4,537,852
240 4,537,860

CLASS 436

518 4,537,861

CLASS 446

445 4,537,577

CLASS 455

161 4,538,300

CLASS 464

31 4,537,578
68 4,537,579
4,537,580

CLASS 474

123 4,537,581

CLASS 493

38 4,537,582
42 4,537,583
93 4,537,584
205 4,537,585
220 4,537,586
315 4,537,587
342 4,537,588
373 4,537,589

CLASS 501

14 4,537,862
15 4,537,863
30 4,537,864
135 4,537,865

CLASS 502

70 4,537,866
74 4,537,867
104 4,537,868
107 4,537,869
111 4,537,870
161 4,537,871
230 4,537,872
242 4,537,873
311 4,537,874
314 4,537,875
342 4,537,876
402 4,537,877

CLASS 514

2 4,537,878
9 4,537,772
4,537,879
19 4,537,880
25 4,537,881
34 4,537,882
63 4,537,773
110 4,537,883
127 4,537,884
183 4,537,885
193 4,537,886
197 4,537,887
228 4,537,888
243 4,537,889
272 4,537,890
4,537,891
275 4,537,779
278 4,537,892
293 4,537,893
301 4,537,894
307 4,537,895
330 4,537,896
351 4,537,897
356 4,537,898
384 4,537,899
398 4,537,775
400 4,537,900
404 4,537,901
422 4,537,902
424 4,537,776
456 4,537,903
464 4,537,780
469 4,537,904
521 4,537,777
4,537,905
532 4,537,906
567 4,537,907
616 4,537,781
659 4,537,908
774 4,537,782

CLASS 518

713 4,537,909

CLASS 521

27 4,537,910
28 4,537,911
53 4,537,912
84.1 4,537,915
107 4,537,913
111 4,537,914

CLASS 523

130 4,537,918
201 4,537,916
209 4,537,917
336 4,537,919
514 Re.31,975

CLASS 524

59 4,537,921
82 4,537,922
100 4,537,923
103 4,537,924
151 4,537,925
388 4,537,926
407 4,537,927
417 4,537,928
504 4,537,929
505 4,537,930
510 4,537,931
572 4,537,932

CLASS 525

71 4,537,933
123 4,537,934
222 4,537,935
236 4,537,936
417 4,537,937
424 4,537,947

CLASS 526

97 4,537,938
179 4,537,939
278 4,537,940

CLASS 527

403 4,537,941

CLASS 528

12 4,537,942
15 4,537,943
18 4,537,944
68 4,537,945
118 4,537,946
215 4,537,948
335 4,537,949
380 4,537,950
388 4,537,951
4,537,953
392 4,537,952
481 4,537,954

CLASS 534

696 4,537,955

CLASS 536

1.1 4,537,956
85 4,537,958

CLASS 544

86 4,537,960
025 4,537,959
193 4,537,961
250 4,537,964
255 4,537,962

CLASS 546

66 4,537,963
82 4,537,965
120 4,537,966
141 4,537,967
209 4,537,968
210 4,537,969
319 4,537,970
320 4,537,971

CLASS 548

302 4,537,972
303 4,537,973
328 4,537,974
359 4,537,975

CLASS 549

54 4,537,976
243 4,537,977
245 4,537,978
347 4,537,979
370 4,537,980
463 4,537,981

CLASSIFICATION OF PATENTS

CLASS 556

22	4,537,982
138	4,537,725
479	4,537,983

CLASS 560

96	4,537,985
061	4,537,984
132	4,537,986
193	4,537,987

CLASS 562

478	4,537,988
501	4,537,989

CLASS 564

63	4,537,990
133	4,537,991
437	4,537,992

CLASS 568

14	4,537,993
59	4,537,994
384	4,537,995
442	4,537,996
454	4,537,997
483	4,537,998
584	4,537,999
616	4,538,000
633	4,538,001
650	4,538,002
656	4,538,003
707	4,538,004
	4,538,005
384	4,538,006
751	4,538,007
783	4,538,008
799	4,538,009
918	4,538,010

CLASS 570

240	4,538,011

CLASS 585

255	4,538,012
361	4,538,013
408	4,538,014
	4,538,015
	4,538,016
415	4,538,017
512	4,538,018

CLASS 604

379	4,537,590
391	4,537,591
411	4,537,593

CLASS 623

3	4,536,893
6	4,536,895
	4,536,896
	4,536,897
22	4,536,894
33	4,536,898

CLASSIFICATION OF DESIGNS

D2—	27	280,250
	28	280,251
	40	280,252
	187	280,253
	283	280,254
	383	280,255
	400	280,256
		280,257
		280,258
D3—	33	280,260
	34	280,261
	35	280,262
	40	280,263
	48	280,264
	71	280,265
		280,266
D4—	130	280,267
	136	280,268
D6—	379	280,269
	380	280,270
	381	280,271
	422	280,272
	474	280,273
	487	280,274
		280,275
	501	280,276
	505	280,277
	508	280,278
		280,279
	566	280,280
	596	280,259
D7—	79	280,281
	404	280,282
D8—	57	280,283
	71	280,284
	72	280,285
	93	280,286
	99	280,287
	499	280,288
D9—	338	280,289
	347	280,290
	349	280,291
	355	280,292
	373	280,293
	385	280,294
	408	280,295
	425	280,296
		280,297
	434	280,298
D10—	40	280,299
	71	280,300
	73	280,301
	74	280,302
	87	280,303
		280,304
		280,305
	103	280,306
	106	280,307
D12—	11	280,308
	112	280,309
	114	280,310
	117	280,311
	155	280,312
	157	280,313
	158	280,315
	177	280,314
	215	280,316
D13—	5	280,317
	11	280,318
	23	280,319
		280,320
	24	280,321
D14—	11	280,322
	12	280,323
	53	280,324
	60	280,325
	115	280,326
D15—	123	280,327
	124	280,328
	144	280,329
D17—	20	280,330
D18—	16	280,331
D19—	84	280,332
	85	280,333
D20—	11	280,334
D21—	87	280,335
	191	280,336
	198	280,337
D23—	77	280,338
	155	280,339
D24—	8	280,340
	36	280,341
	38	280,342
D25—	56	280,343
D26—	3	280,344
		280,345
	75	280,346
	93	280,347
	140	280,348
D28—	29	280,349
	38	280,350
	57	280,351
	64.1	280,352
	78	280,353
	82	280,354

CLASSIFICATION OF PLANTS

P.—	68	5,542
	69	5,543
	70	5,544
	71	5,545
	89	5,546

GEOGRAPHICAL INDEX

OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 : 4,537,102	4,537,328	4,538,046	4,537,382	4,536,910	4,537,715
4,537,615	4,537,341	4,538,053	4,537,541	4,536,926	4,537,717
4,537,781	4,537,347	4,538,056	4,537,572	4,536,953	4,537,720
02 : 4,537,528	4,537,350	4,538,066	4,537,608	4,536,990	4,537,727
04 : 4,537,036	4,537,355	4,538,068	4,537,627	4,537,010	4,537,770
4,537,037	4,537,356	4,538,073	4,537,631	4,537,052	4,537,777
4,537,151	4,537,367	4,538,075	4,537,651	4,537,064	4,537,802
4,537,373	4,537,370	4,538,088	4,537,819	4,537,089	4,537,879
4,537,465	4,537,375	4,538,099	4,537,925	4,537,126	4,537,883
4,538,094	4,537,384	4,538,104	4,537,993	4,537,127	4,537,889
4,538,100	4,537,385	4,538,115	4,538,019	4,537,137	4,537,893
4,538,116	4,537,387	4,538,136	4,538,049	4,537,138	4,537,929
4,538,169	4,537,395	4,538,141	4,538,063	4,537,267	4,537,947
4,538,237	4,537,406	4,538,146	4,538,074	4,537,269	4,537,957
4,538,238	4,537,413	4,538,149	4,538,105	4,537,304	4,537,959
4,538,286	4,537,421	4,538,162	4,538,109	4,537,313	4,537,964
05 : 4,537,225	4,537,434	4,538,163	4,538,147	4,537,316	4,537,965
06 : Re.31,974	4,537,435	4,538,189	4,538,300	4,537,329	4,538,037
4,536,895	4,537,466	4,538,190	10 : 4,537,703	4,537,342	4,538,206
4,536,896	4,537,471	4,538,193	4,537,726	4,537,380	4,538,207
4,536,903	4,537,475	4,538,203	4,537,773	4,537,389	4,538,208
4,536,905	4,537,478	4,538,223	4,537,963	4,537,390	4,538,272
4,536,935	4,537,484	4,538,235	4,538,003	4,537,403	19 : 4,537,028
4,536,945	4,537,507	4,538,241	11 : 4,537,369	4,537,433	4,537,274
4,536,973	4,537,508	4,538,245	12 : 4,536,932	4,537,456	4,537,317
4,536,986	4,537,516	4,538,246	4,536,957	4,537,481	4,537,364
4,536,989	4,537,542	4,538,247	4,537,099	4,537,519	4,537,584
4,536,998	4,537,546	4,538,250	4,537,101	4,537,550	4,538,194
4,537,009	4,537,554	4,538,257	4,537,119	4,537,649	4,538,281
4,537,024	4,537,561	4,538,274	4,537,180	4,537,667	20 : 4,537,117
4,537,058	4,537,582	4,538,277	4,537,249	4,537,716	4,537,436
4,537,059	4,537,605	4,538,293	4,537,372	4,537,800	4,537,759
4,537,071	4,537,620	4,538,299	4,537,401	4,537,866	4,537,772
4,537,076	4,537,623	1,031,684	4,537,443	4,537,907	4,537,775
4,537,079	4,537,646	08 : 4,537,074	4,537,791	4,537,978	4,537,788
4,537,081	4,537,654	4,537,345	4,537,803	4,537,985	21 : 4,537,004
4,537,091	4,537,680	4,537,357	4,537,821	4,538,008	4,537,147
4,537,150	4,537,684	4,537,736	4,538,011	4,538,036	4,537,281
4,537,175	4,537,693	4,537,904	4,538,028	4,538,095	4,537,339
4,537,181	4,537,751	4,537,981	4,538,029	4,538,156	4,537,525
4,537,184	4,537,764	4,538,142	4,538,175	4,538,209	4,537,660
4,537,185	4,537,780	4,538,271	4,538,195	4,538,211	4,537,696
4,537,187	4,537,809	09 : Re.31,975	4,538,196	4,538,224	4,538,025
4,537,189	4,537,827	4,536,982	4,538,249	4,538,273	22 : 4,536,964
4,537,192	4,537,850	4,536,995	4,538,280	18 : 4,536,902	4,537,034
4,537,198	4,537,861	4,537,025	13 : 4,536,919	4,536,931	4,537,069
4,537,200	4,537,943	4,537,049	4,537,015	4,537,124	4,537,144
4,537,214	4,537,974	4,537,070	4,537,026	4,537,318	4,537,415
4,537,216	4,538,012	4,537,219	4,537,637	4,537,326	4,537,676
4,537,237	4,538,020	4,537,232	4,538,021	4,537,366	4,537,724
4,537,246	4,538,023	4,537,242	16 : 4,537,333	4,537,378	4,537,755
4,537,254	4,538,035	4,537,266	17 : 4,536,890	4,537,379	4,537,920
4,537,320	4,538,043	4,537,360	4,536,894	4,537,556	4,537,958

4,538,004
4,538,005
4,538,006
24 : 4,536,939
4,536,960
4,536,975
4,537,111
4,537,231
4,537,529
4,537,805
4,538,130
4,538,150
4,538,154
4,538,228
4,538,275
4,538,276
25 : Re.31,976
4,536,925
4,536,976
4,536,981
4,537,012
4,537,014
4,537,050
4,537,128
4,537,129
4,537,145
4,537,196
4,537,244
4,537,323
4,537,325
4,537,332
4,537,346
4,537,365
4,537,388
4,537,392
4,537,466
4,537,461
4,537,505
4,537,557
4,537,663
4,537,665
4,537,712
4,537,811
4,537,828
4,538,069
4,538,112
4,538,129
4,538,133
4,538,135
4,538,138
4,538,139
4,538,168
4,538,181
4,538,188
4,538,204
4,538,264
4,538,298
26 : 4,536,897
4,537,029
4,537,040
4,537,068
4,537,085
4,537,087
4,537,148
4,537,285
4,537,289
4,537,290
4,537,296
4,537,315
4,537,335
4,537,336
4,537,353
4,537,363
4,537,414
4,537,422
4,537,438
4,537,440

4,537,446
4,537,570
4,537,574
4,537,639
4,537,669
4,537,670
4,537,674
4,537,677
4,537,723
4,537,795
4,537,823
4,537,829
4,537,911
4,537,916
4,537,926
4,538,045
4,538,106
4,538,297
27 : 4,536,928
4,536,988
4,536,992
4,537,002
4,537,045
4,537,047
4,537,077
4,537,080
4,537,082
4,537,183
4,537,194
4,537,220
4,537,310
4,537,327
4,537,404
35 : 4,537,509
36 : 4,537,576
4,537,678
4,537,705
4,537,942
4,538,229
29 : 4,537,441
4,537,559
4,537,601
4,537,860
4,538,092
30 : 4,537,261
4,537,337
4,537,549
4,538,134
34 : 4,536,900
4,536,940
4,536,972
4,536,974
4,536,991
4,537,031
4,537,116
4,537,155
4,537,177
4,537,208
4,537,239
4,537,286
4,537,425
4,537,469
4,537,500
4,537,526
4,537,590
4,537,593
4,537,602
4,537,635
4,537,638
4,537,688
4,537,692
4,537,694
4,537,704
4,537,708
4,537,728
4,537,758
4,537,762

4,537,765
4,537,778
4,537,799
4,537,813
4,537,858
4,537,867
4,537,871
4,537,876
4,537,903
4,537,914
4,537,919
4,537,922
4,537,931
4,537,956
4,537,969
4,537,976
4,537,988
4,537,995
4,537,998
4,538,010
4,538,014
4,538,015
4,538,016
4,538,030
4,538,120
4,538,123
4,538,124
4,538,178
4,538,205
4,538,219
4,538,236
4,538,262
4,538,296
4,537,179
4,536,914
4,536,942
4,536,967
4,536,968
4,536,969
4,536,977
4,536,980
4,537,149
4,537,153
4,537,176
4,537,211
4,537,282
4,537,309
4,537,340
4,537,361
4,537,368
4,537,405
4,537,412
4,537,437
4,537,451
4,537,459
4,537,473
4,537,482
4,537,490
4,537,492
4,537,493
4,537,494
4,537,495
4,537,499
4,537,560
4,537,612
4,537,614
4,537,650
4,537,662
4,537,718
4,537,734
4,537,742
4,537,746
4,537,769
4,537,794
4,537,804
4,537,806
4,537,812

4,537,820
4,537,848
4,537,854
4,537,864
4,537,885
4,537,908
4,537,933
4,537,966
4,537,990
4,538,033
4,538,040
4,538,067
4,538,078
4,538,089
4,538,091
4,538,107
4,538,113
4,538,159
4,538,165
4,538,170
4,538,185
4,538,240
4,538,252
4,538,259
37 : 4,536,904
4,536,911
4,537,048
4,537,197
4,537,217
4,537,234
4,537,583
4,537,616
4,537,912
4,538,225
4,538,269
39 : 4,536,912
4,536,924
4,536,936
4,536,983
4,537,027
4,537,090
4,537,107
4,537,168
4,537,173
4,537,319
4,537,334
4,537,376
4,537,531
4,537,566
4,537,592
4,537,610
4,537,624
4,537,625
4,537,630
4,537,706
4,537,707
4,537,739
4,537,776
4,537,783
4,537,784
4,537,815
4,537,837
4,537,862
4,537,882
4,537,917
4,537,921
4,537,939
4,537,952
4,537,971
4,538,002
4,538,041
4,538,087
4,538,140
4,538,200
4,538,217
4,538,233
40 : 4,537,039

4,537,252
4,537,258
4,537,555
4,537,690
4,537,700
4,537,869
4,537,870
4,537,878
4,537,909
4,537,928
4,537,932
4,537,994
4,538,018
4,538,221
4,538,222
4,538,278
41 : 4,536,947
4,537,586
4,538,155
42 : 4,536,892
4,537,044
4,537,056
4,537,098
4,537,122
4,537,133
4,537,140
4,537,276
4,537,308
4,537,358
4,537,394
4,537,402
4,537,419
4,537,452
4,537,454
4,537,458
4,537,483
4,537,498
4,537,534
4,537,599
4,537,609
4,537,632
4,537,643
4,537,657
4,537,661
4,537,666
4,537,682
4,537,683
4,537,697
4,537,710
4,537,711
4,537,750
4,537,831
4,537,836
4,537,842
4,537,902
4,537,927
4,537,968
4,538,024
4,538,027
4,538,038
4,538,197
4,538,214
4,538,220
44 : 4,537,397
4,538,034
45 : 4,536,985
4,536,994
4,537,096
4,537,351
4,537,634
4,537,816
4,537,991
47 : 4,537,664
4,537,766
4,537,818
4,537,937
48 : Re.31,977

4,536,941
4,537,035
4,537,038
4,537,063
4,537,067
4,537,093
4,537,213
4,537,233
4,537,250
4,537,251
4,537,255
4,537,256
4,537,311
4,537,371
4,537,383
4,537,409
4,537,426
4,537,427
4,537,428
4,537,429
4,537,457
4,537,532
4,537,543
4,537,548
4,537,685
4,537,689
4,537,785
4,537,786
4,537,892
4,538,017
4,538,157
4,538,213
4,538,230
4,538,239
4,538,248
4,538,251
4,538,265
4,538,270
4,538,282
4,538,283
4,538,287
49 : 4,536,889
4,537,193
50 : 4,537,243
4,538,212
51 : 4,536,944
4,537,104
4,537,416
4,537,463
4,537,591
4,537,679
4,537,687
4,537,733
4,537,747
4,538,001
4,538,080
53 : 4,537,123
4,537,398
4,537,502
4,537,603
4,537,647
4,537,740
4,537,741
4,537,835
4,538,215
55 : 4,536,901
4,536,962
4,537,061
4,537,100
4,537,121
4,537,152
4,537,393
4,537,522
4,537,681
4,538,199
4,538,289
56 : 4,537,675

DESIGN PATENTS

04 : 280,263
280,315
06 : 280,260
280,262
280,265
280,274
280,275
280,294
280,307
280,309
280,326
280,335
08 : 280,313
09 : 280,271
280,306

12 : 280,255
280,317
280,323
280,348
17 : 280,261
280,264
280,282
280,288
280,290
280,318
280,327
18 : 280,291
280,312
21 : 280,257

280,341
280,255
280,273
280,280
280,281
280,284
280,300
280,344
280,345
26 : 280,334
27 : 280,250
280,310
280,329
33 : 280,319

280,258
280,266
280,311
25 : 280,273
280,280
280,281
280,284
280,300
280,344
280,345
280,334
280,250
280,310
280,329
280,319

280,320
34 : 280,269
280,322
280,325
280,331
36 : 280,251
280,270
280,289
280,296
280,297
280,303
280,304
280,305
280,314
280,350

280,352
37 : 280,267
39 : 280,252
280,292
280,298
40 : 280,316
280,339
41 : 280,253
42 : 280,343
280,347
44 : 280,268
280,328
280,349
45 : 280,287

48 : 280,259
280,285
280,351
49 : 280,256
280,346
53 : 280,299
55 : 280,277
280,278
280,279
280,302
280,332
280,333
280,337
280,342

PLANT PATENTS

34 : 5,546

U.S. GOVERNMENT PRINTING OFFICE : O—1985

CHANGE OF ADDRESS FORM

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

Mail this form to: NEW ADDRESS

Superintendent of Documents
Government Printing Office SSOM
Washington, D.C. 20402

Attach last subscription label here.

SUBSCRIPTION ORDER FORM

SUBSCRIPTION ORDER FORM

ENTER MY SUBSCRIPTION TO:

@ $ Domestic; @ $ Foreign.

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

☐ Remittance Enclosed (Make checks payable to Superintendent of Documents)

☐ Charge to my Deposit Account No. .....

MAIL ORDER FORM TO:
Superintendent of Documents
Government Printing Office
Washington, D.C. 20402

U.S. DEPARTMENT OF COMMERCE
Malcolm Baldrige, Secretary
PATENT AND TRADEMARK OFFICE
Donald J. Quigg, Acting Commissioner